Virginia Medical Monthly

Official Organ of the Medical Society of Virginia

Vol. 56, No. 3.
WHOLE No. 924.

RICHMOND, VA., JUNE, 1929

20 CENTS A COPY
$2.00 A YEAR

SOME RECENT OBSERVATIONS ON ADRENAL FUNCTION.*

By S. W. BRITTON, B. S., M. D., University, Va.
Professor of Physiology, University of Virginia.

Considerable controversy has been carried on in this country for more than a decade with reference to the function of the adrenal glands. While the evidence presented by one body of workers (Stewart *et al*)[1] tends to show that the medulliadrenal tissues exert no marked or indispensable influence on life, the results of others (Cannon *et al*)[2] indicate a definitely positive rôle for adrenin secretion in major as well as minor bodily activities. Very little experimental support for the former school of workers appears to have been advanced within the past few years. The more recent investigations of Cannon and his collaborators, however, seem to confirm and establish their earlier results, and, furthermore, a large number of contributors from many quarters have brought forward corroborative evidence, obtained by various experimental methods, of the Harvard investigators. It is proposed briefly to review, in the present paper, particularly, the findings of the latter school of workers.

The denervated heart for the detection of internal secretion. The pupillary and intestinal strip methods, and also the test involving the estimation of changes in adrenin content of the glands, have been employed for the determination of adrenin secretion for a number of years. Recent investigations in which animals with the heart completely separated from the nervous system have been used[3] have confirmed many older observations and added considerably to our knowledge of adrenal function. A number of technical difficulties arose in connection with the preparation of animals with the heart fully denervated; in the hands of Cannon and his associates it was eventually found, however, that the nervous influences could be successfully eliminated in a one-stage operation. It was observed, moreover, that under ordinary laboratory conditions the cardio-denervate animals could be kept indefinitely in apparently normal health. In such animals it will be evident that changes in the blood content alone may readily affect cardiac activity. With due provision having been made for the elimination of such influences as thyroid and hepatic secretions, already known to affect the denervated heart, the presence and influence of the secretion from the adrenal medulla may readily be detected.

Evidence has been furnished[4] that in the cat as small an injection of adrenalin as 0.00068 mgm. per kilo per minute increases the heart rate as much as 34 beats per minute. The isolated heart of the cat is also said to be sensitive to adrenalin in the dilution of 1:1,400,000,000.[5]

Details for the preparation of animals with the heart completely isolated from its nervous control, together with a consideration of the physiological significance of reactions derivable from such animals, may be found elsewhere.[3]

Emotional activities and the adrenal mechanism. In a large number of animals (cats) which were observed for periods ranging from a few months to over a year, indubitable evidence[6] of medulliadrenal discharge under many different conditions was obtained. As is well known, cats may fairly readily be stimulated to display typical emotional reactions: the dorsal fur is raised, teeth and claws are bared, and hissing and snarling occur often on slight provocation only. Cats which were subjected to moderate temporary restraint quickly showed such emotional excitement, accompanied usually by only slight muscular activity. Corresponding with such reactions, in animals with the adrenal glands present, the denervated heart was found to indicate by its accelerated rate an outpouring of secretion from the adrenal medulla. In twenty-five cases the cardiac increments were from 20 to 40 beats per minute above the resting rate (usually about 120 in the cat)—and this following periods of excitation lasting only from 5 to 15

*Abstract of an address given at a meeting of the University of Virginia Medical Society, November 19, 1928, and covering original work carried out in part by the author.

XUM

seconds. Minor muscular activity alone, as in walking about the laboratory for one to two minutes, also resulted in a slightly increased adrenin output.

When great emotional excitement with fairly vigorous muscular movement was evoked, as by an aggressive dog brought before the caged cat, there was very striking evidence of adrenal discharge. In over fifty experiments the denervated heart rate rose from 30 to over 110 beats above the quiet, basal level. Usually these maximal increases occurred, also, either synchronous with or within a minute or so after the emotional outburst. From twenty to forty minutes often elapsed, moreover, before basal rates were again recorded, indicative very evidently of the prolonged effect on deep-seated glandular mechanisms of only brief periods (in these cases from twenty to sixty seconds) of emotional stimulation. The possible ultimate influences of such visceral concomitants of excitement on vasomotor, digestive and other important functions can only be conjectured at present.

Similar evidence of medulliadrenal involvement in pseudaffective or quasi-emotional reactions in decorticate preparations—animals which had been surgically deprived of cortical (cerebral) control—was also furnished by recent investigations.[7] Correlated with these reactions there were noted large increments in the blood-sugar level; these did not occur, however, in the absence of the normal adrenin secretion.

In a further series of experiments[8] the prepotency of medulliadrenal influence over that exerted by nervous agencies in emotional hyperglycemia was also shown. Noteworthy *diminutions* in the blood-sugar level of 5 to 15 per cent were observed indeed during great emotional excitement in animals (cats, exposed to a dog) which had been medulliadrenalectomized. In contrast, those animals possessing intact adrenal glands but deprived of the nerve fibres normally influencing glycogenolysis showed on similar excitation considerable *increases* in the glycemic percentage. From a number of animals with normal adrenals the hyperglycemic reactions evoked during excitement were very marked, the blood-sugar increases in some cases being from 50 to over 100 per cent above the twenty-four-hour fasting levels. The importance of adrenin secretion in bodily reactions is therefore again strikingly demonstrated. Medulliadrenal intervention appears to be of significance particularly in the calling forth of readily available fuel for muscular activities which are initiated during conditions of urgency.

Medulliadrenal secretion and insulin hypoglycemia. The effect of adrenalin administered during hypoglycemic reactions from insulin in man is well known. It has recently been pointed out that the phenomena which are related to a low blood-sugar level are similar to those observed on adrenalin injection. Wilder and Boothby[9] early surmised adrenal hyperactivity in hypoglycemia.

Proof has now been advanced[10] that augmentation of adrenin secretion—an obviously protective mechanism—takes place during the endangering phases of insulin activity. Further, if the adrenal medulla has been evacuated it is found[11] that animals become five to ten times as sensitive to insulin. Even extremely minute doses of insulin administered months after the medulliadrenal operation (the cortex of the glands being left intact) readily produce severe hypoglycemic convulsions. Small amounts of adrenalin effectively overcome the seizures.

These medulliadrenalectomized animals showed no depreciation, it should be noted, in their hepatic glycogen reserves.[11-12] Muscle glycogen also was present in normal amount. The availability of the glycogen reserves to the interdependent parts of the organism was undoubtedly very much restricted, however, in the absence from the blood stream of the normal secretion of the adrenal medulla.

Temperature regulation and the adrenal glands. In the chemical regulation of body temperature the rôle of adrenin secretion once more comes into the foreground. Animals with the heart completely denervated, and surviving in apparently perfect health in the laboratory, have again been used as test objects.[13] On exposure of such aniamls to cold surroundings, it is observed that, if the adrenal glands are intact, the rate of the denervated heart is gradually accelerated during the time of exposure, to return again to the resting level on withdrawal from the cold. Inactivation of the medullary tissues in the same animals is followed by insignificant changes in the heart rate—sometimes indeed by diminutions—on similar cold exposure.

Conditions which would naturally produce

a lowering of body temperature thus appear to evoke a marked discharge from the adrenal medulla into the circulating blood. The results of the above, and also of a number of other variously-devised experiments, give evidence of a true calorigenic function for normally secreted adrenin.

Some observations in connection with the interesting phenomenon of hibernation[14] may also be given brief reference. To mention first the very remarkable series of changes that take place on recovery of animals from winter sleep—the rapid elevation of the body temperature, the great increase in heart rate and blood pressure, the augmentation of the blood sugar from the hypoglycemic to a normal level, the shivering and general raising of the hairs —these and many other notable changes which are observed have for many decades challenged elucidation.

That the sympathico-adrenal mechanism is largely responsible for the initiation and maintenance of these striking activities is suggested by the experimental evidence which has recently been presented.[14] The administration of minute amounts of adrenalin to insulinised and cooled (artifically hibernating) animals resulted in the appearance of practically all the foregoing phenomena. It was noted, moreover, that animals which had previously undergone adrenomedullary ablation gave no evidence of spontaneous ability to recover their normal body temperature and blood sugar levels, as did the control animals with adrenal glands intact.

The initiation of hibernation, it is also suggested on the basis of a number of considerations, may be related to a natural autumnal depression, in the face of approaching climatic rigors, of the highly differentiated adrenal tissues in thermotactically unstable hibernating organisms. Further work on this subject, however, is necessary, and is at present being planned.

Conclusions. Animals with completely denervated hearts, surviving indefinitely in excellent health in the laboratory, have proved of considerable value for the detection of internal secretion. The secretion of the adrenal medulla is shown by these animals to be exceedingly important in connection particularly with the major as well as minor bodily functions.

While the ordinary life processes in an animal may be apparently well sustained after ablation of the medulliadrenal tissues, the accumulated evidence demonstrates that under certain critical or emergency conditions a marked incompetence of the organism becomes evident. Significant testimony is afforded that there is related to various neuromuscular activities and emotional conditions, to insulin (hypoglycemic) reactions and also to environmental temperature changes, an augmented activity of the adrenal medulla. This hyperactivity subserves the immediate function, at least, of sustaining and preserving the best interests of the organism.

Whether the continuation and extension of exaggerated visceral activities in time may lead to ultraphysiological or pathological sequences is a matter for further experiment and consideration.

REFERENCES.

1. G. N. Stewart and J. M. Rogoff: *Amer. Jour. Physiol.*, 1917, xliv, 543; *ibid.*, 1923, lxvi, 235.
2. W. B. Cannon and D. de la Paz: *Amer. Jour. Physiol.*, 1911, xxviii, 64; W. B. Cannon, *ibid.*, 1919, 1,399.
   W. B. Cannon and W. L. Mendenhall: *Amer. Jour. Physiol.*, 1914, xxxiv, 243.
   P. D. Lamson: *Jour. Pharm. Exper. Ther.*, 1915, vii, 169.
   C. H. Kellaway: *Jour. Physiol.*, 1919, liii, 211.
3. W. B. Cannon, J. T. Lewis and S. W. Britton: *Amer. Jour. Physiol.*, 1926, lxxvii, 326.
4. W. B. Cannon and D. Rapport: *Amer. Jour. Physiol.*, 1921, lviii, 308.
5. G. V. Anrep and I. de B. Daly: *Proc. Roy Soc., B.*, 1925, xcvii, 454.
6. W. B. Cannon and S. W. Britton: *Amer. Jour. Physiol.*, 1927, lxxxix, 433.
7. W. B. Cannon and S. W. Britton: *Amer. Jour. Physiol.*, 1925, lxxii, 283.
8. S. W. Britton: *Amer. Jour. Physiol.*, 1928, lxxxvi, 340.
9. R. M. Wilder, W. M. Boothby, *et al.*: *Jour. Met. Res.*, 1922, ii. 722.
10. W. B. Cannon, M. A. McIver and S. W. Bliss: *Amer. Jour. Physiol.*, 1924, lxix, 46.
11. S. W. Britton, E. M. K. Geiling and H. O. Calvery: *Amer. Jour. Physiol.*, 1928, lxxxiv, 141.
12. G. N. Stewart and J. M. Rogoff: *Amer. Jour. Physiol.*, 1918, xlvi, 90.
13. W. B. Cannon, A. Querido, S. W. Britton and E. M. Bright: *Amer. Jour. Physiol.*, 1927, lxxix, 466.
14. S. W. Britton: *Amer. Jour. Physiol.*, 1928, lxxxiv, 119.

Just take this comfort into your soul,
In the world of your worries and frets
The football could never score a goal
Were it not for the kick it gets.

Hospital Buyer.

XUM

THE CUMULATIVE ACTION OF INSULIN: THE PROLONGED ACTION OF INSULIN AND ITS PRACTICAL APPLICATION.*

By MARTIN LASERSOHN, M. D., Richmond, Va.
Associate in Medicine, Medical College of Virginia.

Occurrence, Disadvantage, and Danger of Reactions

The occurrence of insulin reactions is perhaps the most annoying problem with which the physician has to deal in the treatment of diabetes mellitus. Hypoglycemic shock is not only distressing but it may be productive of harm and even endanger life. Bodily injury and injury to others during a period of amnesia may result. Insulin shocks may be so discouraging that despite his physician's insistent advice the patient may decide to give up the use of insulin altogether. That repeated depletion of the glycogen store may result in visceral damage, especially of the liver, is a possibility, and recently the removal of glycogen from the cardiac muscle has been offered as an explanation of death occurring occasionally in insulin treated diabetics with cardiac disease. A dozen or more deaths have been reported from the use of insulin and there are references in the literature to instances where lives have been saved only through the quick recognition of hypoglycemic coma and the immediate institution of therapy that restored the lost carbohydrate. A realization of these relatively few adversities, practically all preventable and certainly representing a very low mortality, should not however intimidate the physician and make him return to the older method of treating all diabetics by dietary restriction alone. By the proper use of this remarkably effective agent the diabetic can be restored to well-being and to normal mental and physical fitness, results unattainable without the use of insulin.

Prolonged Action of Insulin and Reactions

In summarizing the insulin reactions that I have witnessed I was particularly struck with the time of their occurrence. Early in the treatment reactions, if they appeared, became evident after any single dose of the drug, and there was no relation to any special hour or time of the day. In patients under treatment for a prolonged period, in whom the amount of insulin at each injection was reduced in an effort to prevent reactions, it was particularly striking to note that the majority of these reactions occurred in the evening. As these patients were getting two or more doses of insulin a day, and because each dose was so reduced from time to time so that in itself it would not produce hypoglycemic symptoms, determined by experience in each case, it appeared that a likely explanation of the occurrence of these reactions could be based on the hypothesis that insulin might have a cumulative action. References in the literature on work with insulin can be found which encourage such an assumption. Joslin[1] states that: "The action of insulin is immediate, but the full extent of an injection does not reach a maximum for about sixty minutes or cease for some six to eight or even ten hours". Fletcher and Campbell,[2] noting the effect on the blood-sugar after giving 20 units of insulin to a series of diabetics, upon whom they did hourly blood-sugar tests, showed that the action of insulin was still noticeable at the end of seven hours. Fitz, Murphy and Grant reported the effect of insulin on the respiratory quotient in four cases of diabetes. In all of them the quotient was definitely increased. In two cases it was still high on the third day following injection of the insulin. In discussing these findings Campbell[3] states that "this suggests the possible storage of carbohydrate in a form utilizable by the body or a prolonged action of insulin." Campbell goes on to say that there "seems to be a tendency for the high R. Q. to persist over several days, indicating either that the storage complex produced from carbohydrate by insulin requires no further insulin in its catabolism or that insulin has a more prolonged action than has previously been believed".

Maddock and Trimble,[4] investigating prolonged insulin hypoglycemia showed that in a case where two injections were given daily there was a much greater drop in the blood sugar after the second dose of the drug than after the first although the first dose, given before breakfast, was 24 units and the second

*From the Department of Internal Medicine, Medical College of Virginia, Richmond, Va.

Read at the fifty-ninth annual meeting of the Medical Society of Virginia, in Danville, October 16-18, 1928.

1. The Treatment of Diabetes Mellitus, E. P. Joslin, 1928, p. 40.
2. Fletcher and Campbell, **Jour. Metab. Res.**, 1928, vol. 2.
3. Macleod and Campbell, Medicine, 1924, vol. 3, pp. 255-257.
4. Maddock and Trimble, **J. A. M. A.**, 1928 (Sept. 1), vol. 91, p. 616.

dose, given before supper, was 16 units. Following the 24 units the blood sugar dropped to a minimum of 169 mgm.; following the 16 unit injection, despite a previous luncheon taken without insulin and a dinner consisting of 13 grams more carbohydrate than at breakfast, the blood sugar dropped to a minimum of 39 at 2 A. M. Another patient, receiving three injections in the day had reactions only after the last dose, about 9 P. M.

Of course, one dose of insulin, if large enough, will cause a rapid, sharp drop in the blood sugar and a reaction. Such excessive dosage accounts for some reactions, especially in cases just coming under treatment and seen before the carbohydrate tolerance is well estimated. In this connection it is worth remembering that the glucose equivalent is relatively much larger per unit of insulin with smaller than with larger doses.

As soon as a balance between the carbohydrate intake and the insulin administration is reached, reactions disappear except for the type that occur only in the evening, after a second or third dose.

In my series, case 3 (Table I) was having reactions about three o'clock in the afternoon. During this period the insulin was being taken before breakfast, and before lunch. When injections were changed to precede lunch and supper, the reactions occurred in the evening after supper; when the second injection was taken immediately after supper the reaction was only delayed until eight to nine P. M. When this patient was advised to take this second dose at bed-time all symptoms disappeared and for the past four months there have been no reactions. Furthermore, the blood sugar, while previously high before breakfast, is now normal. Case 81 (Table II), after the preliminary experiences with excessive dosage, began to have reactions regularly at 9 P. M. At this time he was getting two injections of insulin a day, one before lunch and one before supper. He was advised to postpone the supper dose to bed-time, following which his evening reactions disappeared. He had, from time to time, some mild afternoon reactions, as his tolerance increased, but these became milder and then disappeared with the gradual diminution from 30 units to 20 units in the luncheon dose of insulin. This patient had been having rather high early morning (fasting) blood sugars, but since the administration of the second dose of insulin at bed-time these blood sugars have become

TABLE I

MONTHLY OBSERVATIONS ABSTRACTED FROM RECORD, CASE R. T. B.

SHOWS CHANGES IN DIET AND INSULIN DOSAGE WITH OBSERVATIONS OF WEIGHT AND BLOOD SUGAR. CASE 3.

DATE 1926 1927	DIET FOOD INTAKE (GRAMS)				INSULIN UNITS				WT.	BLOOD SUGAR (mgm. per 100 cc.)		REMARKS
	P	F	C	CAL.	B.	L.	S.	T.	(LBS.)	MAX.	MIN.	
January	25	80	45	1,000	20	20	0	40	130	206	96	
February	82	160	49	1,964	10	30	20	60	136	241	175	Reactions in P. M.
March	94	172	49	2,120	10	30	15	55	140	210	177	
April	94	172	49	2,120	10	25	10	45	140	204	194	Reactions in A. M. and P. M.
May	93	241	70	2,821	15	25	0	40	142	225	222	
June	93	241	70	2,821	15	25	0	40	144	194	...	One sugar estimation made
July	93	241	70	2,821	15	30	0	45	147	...	93*	Reaction in P. M.
August	93	241	70	2,821	10	20	0	30	146	125*	87*	
September	93	241	70	2,821	10	20	0	30	143	208	...	Grippe for 5 days
October	83	218	91	2,658	10	20	0	30	...	190	...	
December	83	218	91	2,658	0	15	15	30	148	250	79	24 hour urine, trace sugar Insulin rearranged.
February	83	218	91	2,658	0	15	20	35	146	196	187	Min. blood sugar taken 2 hours after breakfast.
April	83	218	91	2,658	0	20	25	45	...	148	116	Last dose insulin immediately after supper. Grippe 8 days
June	83	218	91	2,658	0	20	20	40	142	125	97*	Reactions after supper
September	83	218	91	2,658	0	20	20	40	147	...	87*	
October	83	218	101	2,698	0	20	20	40	146	165*	...	

*Blood taken for blood-sugar determination 2 P. M.–3 P. M. (after lunch). All other blood taken before breakfast.
B.—Breakfast L.—Lunch. S.—Supper T.—Total.

practically normal (Table III). It is of value to determine the effect of a single dose of insulin; this will in a great measure bring out its prolonged action and the blood sugar readings so obtained will be of aid in determining the optimum time of a second administration. The practical value of such data cannot be over-emphasized. A blood sugar estimation, taken in the morning before breakfast is no longer an entirely reliable guide as to the diabetic status; insulin markedly alters the blood sugar estimations from hour to hour. (Table IV).

The Application of the Prolonged Effect of Insulin

The prolonged effect of insulin, allowing of a cumulative action, can be advantageously utilized in the treatment of diabetes. When two or three doses of the drug a day are neces-

Table 2. Case 81

Date 1928	Diet Food Intake (Grams)				Insulin Units					Weight	Blood Sugar (mgm. per 100 cc.)	Time Blood Taken
	P.	F.	C.	Cal.	B.	L.	S.	R.	T.			
2-8	Before treatment									112	282	10 A. M.
2-9	Before treatment										277	B. B.
2-10	Before treatment										290	2 P. M.
2-11	70	150	50	1830	0	20	20	0	40			
2-13	70	150	50	1830	0	20	20	0	40	115½		
2-18	70	150	50	1830	0	20	20	0	40		217	10 A. M.
2-20	75	200	60	2340	0	30	30	0	60			
2-27	75	200	55	2320	0	30	30	0	60	114½	244	10 A. M.
3-1	75	200	55	2320	0	30	30	0	60		182	10 A. M.
3-9	75	200	55	2320	0	30	30	0	60	121		
3-14	75	200	55	2320	0	30	30	0	60	122	230	B. B.
3-14	75	200	55	2320	0	30	0	20	50		129	2 P. M.
3-19	75	200	55	2320	0	30	0	20	50	124½		
4-16	75	200	55	2320	0	30	0	20	50		215	B. B.
4-16	75	200	55	2320	0	30	0	20	50	133	82	3 P. M.
5-1	75	200	55	2320	0	30	0	25	55	135	212	B. B.
5-11	75	200	55	2320	0	30	0	25	55	133½	168	B. B.
7-2	75	200	55	2320	0	30	0	25	55		178	10 A. M.
7-2	75	200	55	2320	0	30	0	25	55		98	2 P. M.
7-3	75	200	55	2320	0	30	0	20	50	138		
9-4	75	200	55	2320	0	30	0	20	50	136½	161	B. B.
9-4	75	200	55	2320	0	30	0	20	50		80	2.30 P. M.
9-5	75	200	55	2320	0	25	0	15	40			
9-24	75	200	55	2320	0	25	0	15	40		168	11 A. M.
9-25	75	200	55	2320	0	25	0	15	40		81	3 P. M.

B.—Breakfast. L.—Lunch. S.—Supper. T. Total R.—Retirement. B. B. —Before Breakfast.

Table 3

Date, 1928	Blood Sugar (mgm. per 100 cc.)
February 13	217
February 14	230
April 16	215
.....	
May 1	213
May 11	168
July 2	178
September 4	161
October 12	110

Case 81, taking 30 units of insulin before lunch and 20 units before supper. Total insulin daily: 50 units. The pre-breakfast blood sugar readings under this regime are shown above the dotted line.

This patient was then advised to take the same total amount of insulin (50 units), but to postpone the dose previously taken before supper to bed-time. Below the dotted line are the pre-breakfast blood sugar observations made after this change.

Table 4

Date, 1928	Blood Sugar Before Breakfast (mgm. per 100 cc.)	Blood Sugar 2-3 P. M. (mgm. per 100 cc.)
*February 9	278	290
March 14	230	129
April 16	215	82
July 2	178	98
September 4	161	80
September 25	168	82
October 12	110	85

*Before treatment started.

Blood-sugar estimations made before breakfast and in the afternoon of the same day (2-3 P. M.) in Case 81. On these days, the patient had no afternoon reaction. It can readily be seen that a second dose of insulin taken before supper might produce evening reactions, as happened in this case, although the entire allotted amount of supper was eaten. A blood-sugar estimations, taken in the morning, before breakfast, is not an entirely reliable guide as to the the diabetic status, as a comparison between these "fasting" blood sugars and the afternoon blood sugars brings out.

sary, it is apparent that these should not be too closely spaced. When the proper time of administration is employed, and when the division of the total daily food intake is planned so that its utilization is not too far ahead of the action of the insulin, the occurrence of reactions may be entirely avoided, or certainly reduced to a minimum. Especially is this true when, after a few months of treatment, the endogenous insulin secretion becames more or less stationary and rapid pancreatic improvement ceases.[5] The blood sugar will be more constantly near the normal level throughout the day and the night. The rather high morning fasting blood sugar, seen even in well controlled insulin cases, may also be avoided.

After midnight the blood sugar in the diabetic tends to rise, and sugar may appear in the urine, because of the breakdown of glycogen which has been stored during the day. It is nocturnal glycogenolysis that accounts for the high morning blood sugars in diabetes; there has been no intake of food during the night. By giving a second dose of insulin at bed-time, say about 11 P. M., the cumulative action is not only avoided, for under such circumstances it would be fully nine or ten hours after the previous dose, but the undesirable steady rise in the blood sugar occurring during the night is also prevented (Table 3). Some observers give the insulin before breakfast and before supper thereby avoiding in the main the effects of the prolonged action of the drug, but it would seem better to give the second dose at bed-time because the carbohydrate metabolism can then be kept more nearly normal also during the night. Then too, with two doses of the drug a day, it is necessary to keep the carbohydrate of one of the three meals low. A low carbohydrate breakfast can be most conveniently arranged in the planning of diets. A practical and effective method of arranging the diet so that its utilization may be synchronized with the action of the insulin is demonstrated by the diet now used in case 3 (Table 5).

TABLE 5

BREAKFAST

	AMT.	P	F	C
Orange Juice	100	0	0	11
Bacon	40	4	27	0
Egg	Two	12	12	0
Cream	50	1	8	2
Butter	20	0	17	0
Coffee	Cup	..	..	..
Total		17	64	13

LUNCH

	AMT.	P	F	C
Meat (approximate values): Round Steak, Porterhouse, Tenderloin, Roast Beef	150	30	30	0
Vegetable 5%	100	1	0	3
Vegetable 5%	100	1	0	3
Vegetable 10%	100	1	0	6
Bread	20	2	0	10.5
Butter	50	0	42.5	0
Mayonnaise	15	0	12.5	0
Cream	100	2.5	16	4.5
Banana	100	1.5	0	21
Clear Broth	200	0	0	0
Coffee	Cup	0	0	0
Total		39	101	48

SUPPER

	AMT.	P	F	C
Clear Broth	Bowl	0	0	0
Ham	100	16	30	0
Vegetable 5%	100	1	0	3
Vegetable 10%	100	1	0	6
Egg	One	6	6	0
Butter	20	0	17	0
Orange	100	0	0	11
Bread	20	3	0	10
Coffee	Cup	0	0	0
Total		27	53	30

SUMMARY

	P	F	C	I
Breakfast	17	64	13	0
Lunch	39	101	48	15
Supper	27	53	30	10
Total	83	218	91	25

5. Lasersohn, M.: The Curability of Diabetes Mellitus, Va. Med. Monthly, June, 1927.

After midnight the blood sugar in the diabetic tends to rise, and sugar may appear in the urine, because of the breakdown of glycogen which has been stored during the day. It is nocturnal glycogenolysis that accounts for the high morning blood sugars in diabetes; there has been no intake of food during the night. By giving a second dose of insulin at bed-time, say about 11 P. M., the cumulative action is not only avoided, for under such circumstances it would be fully nine or ten hours after the previous dose, but the undesirable steady rise in the blood sugar occurring during the night is also prevented (Table 3). Some observers give the insulin before breakfast and before supper thereby avoiding in the main the effects of the prolonged action of the drug, but it would seem better to give the second dose at bed-time because the carbohydrate metabolism can then be kept more nearly normal also during the night. Then too, with two doses of the drug a day, it is necessary to keep the carbohydrate of one of the three meals low. A low carbohydrate breakfast can be most conveniently arranged in the planning of diets. A practical and effective method of arranging the diet so that its utilization may be synchronized with the action of the insulin is demonstrated by the diet now used in case 3 (Table 5).

DISCUSSION.

DR. T. DEWEY DAVIS, Richmond: This paper of Dr. Lasersohn's brings up one or two practical points. Joslin has emphasized the fact that the problem of diabetes under modern treatment is not so much death from coma as it is death from arteriosclerosis. In other words, we keep the diabetic individual living long enough for him to develop and die of arteriosclerosis. We know that the increase of sugar and fat in the blood of diabetics is a potent factor in the causation of anteriosclerosis. It is common, as Dr. Lasersohn said, for the blood sugar to be increased in the early morning hours because the effect of the insulin has worn off during the night. If we can arrange an insulin schedule so as to prevent this rise in blood sugar it is reasonable to believe that we can at least delay the development of arteriosclerosis. In conclusion, I want to emphasize the point that today arteriosclerosis is the biggest problem in diabetes.

DR. LASERSOHN, closing the discussion: I think the point brought out by Dr. Davis is a most important one, because, as he said, the well treated diabetic now lives not to die of coma or of other characteristic affections that formerly caused death. He now lives to an age where he may get arterial sclerosis, but he may develop it much sooner than the average person does.

Insulin is given in the manner described not only to prevent the accumulation of sugar, but also to prevent reactions. Reactions discourage the pa-

tient, they upset him, and they may also be harmful. Several of these patients have been arrested in an amnesic state, and other injustices may be done them. We should do what we can to prevent reactions.

I think, however, that the dangers of insulin have been overemphasized. It is not a very dangerous drug to use if one knows something about it. Some physicians are afraid to give it, and a number of diabetics are not getting enough of this valuable drug. The danger from not getting enough is as great as from getting too much insulin.

THE REACTION OF THE NEGRO TO BILATERAL OOPHORECTOMY.*

By RICHARD H. MEADE, JR., M. D., University, Va.

That negroes react less markedly to loss of ovarian tissue than do whites is an impression held by many surgeons. A search of the literature as far back as 1892, however, has failed to disclose a single article dealing with this subject. Because of this dearth of data it has seemed worthwhile to make a study of a series of unselected cases of bilateral oophorectomy in negroes and in whites extending over a period of five years. Accordingly, an attempt was made to get in touch with all patients who during their active menstrual life had had bilateral oophorectomies performed on them at the University Hospital since January, 1923. There were one hundred and twenty in this group. Of this number sixty-two, or 51 per cent, were followed by letter or visit. One was dead, and three proved not to have had complete operations. This gave a series of thirty-nine negroes and nineteen whites. All but twelve of these had had hysterectomies as well as bilateral oophorectomies done, but as the number is small and their reactions similar to the others they were included in one group.

In order to rule out, as far as possible, any discrepancies that might result from differences in ages and post-operative periods, studies of the cases from these aspects have been done. Furthermore, the cases have been analyzed according to the extent of ovarian inflammation at the time of operation.

Classification of Reactions

The usual manifestations of complete loss of ovarian tissue were found in the majority of the patients in this series. As was to be expected, hot flushes were most frequent. They varied in severity from mild occasional ones to those making life quite miserable. Other symptoms less frequently encountered were vertigo, palpitation, headache, insomnia, cold extremities, and varied types of nervousness. For purposes of classification these reactions have been termed mild, or marked.

In the symptomless group there was a larger percentage of white women, while in the groups of mild and marked symptoms the reverse was found to be the case. In this whole series only five patients had severe reactions, four were negroes and one was a white patient. The latter was a woman of thirty-six who had been operated upon six months previously because of multiple fibromyomata of the uterus. Her ovaries, except for the presence of small cysts, were normal. At the time of her report she was having very severe hot flushes, was irritable, and nervous, and could not sleep. Three of the negroes were operated upon for similar reasons, while the fourth had had an extensive inflammatory process involving her tubes and ovaries. She was only twenty-four and, when reporting three years after operation, complained of extreme nervousness, severe hot flushes, night sweats and cold extremities. (Table I).

Reaction to Bilateral Oophorectomy

Table I. Grouping According to Severity of Symptoms

	No.	%	Average Age	Post-Operative Period
No symptoms				
White.....	6	31.6	42	21 months
Negro.....	8	20.5	40	21 months
Mild Symptoms				
White.....	12	63.1	35	22 months
Negro.....	27	69.2	35	27 months
Marked Symptoms				
White.....	1	5.3	36	6 months
Negro.....	4	10.3	32	14 months

Results According to Age Grouping

Patients were grouped according to their ages and a study of their reactions made on this basis. In the group from eighteen to thirty, all of the five white patients presented mild symptoms, while one negro had no symptoms, seven of the nine negroes had mild ones and one reported marked symptoms. In the next age period, thirty-one to forty, a smaller percentage of negroes were free from symptoms, (25 per cent against 50 per cent). And

*From the Department of Surgery and Gynecology of the University of Virginia, and the University Hospital.

Read before the fifty-ninth annual meeting of the Medical Society of Virginia, Danville, Va., October 16-18, 1928.

this was also true in the patients of forty-one or more. (Table II).

Reaction to Bilateral Oophorectomy

Table II. Grouping According to Age

	No.	No Symptoms	Mild Symptoms	Marked Symptoms
18 to 30 Years				
White	5	0	5 or 100%	0
Negro	9	1 or 11%	7 or 78%	1 or 11%
31 to 40 Years				
White	6	3 or 50%	2 or 33.3%	1 or 16.7%
Negro	20	5 or 25%	13 or 65%	2 or 10%
41 and over				
White	8	3 or 37.5%	5 or 62.5%	0
Negro	10	2 or 20%	7 or 70%	1 or 10%

Results According to Post-Operative Period

In studying the reactions of the patients from the standpoint of the duration of the post-operative period, the negroes are found, on the whole, to have had slightly more symptoms but as a glance at the table will show the differences are slight. In the three to twelve months' group, there was indeed a slightly greater percentage of whites having mild symptoms. (Table III).

Reaction to Bilateral Oophorectomy

Table III. Grouping According to Post-Operative Period

	No.	No Symptoms	Mild Symptoms	Marked Symptoms
3 to 12 months				
White	8	3 or 37.5%	4 or 50%	1 or 12.5%
Negro	12	4 or 33.3%	5 or 41.7%	3 or 25%
13 to 24 months				
White	5	1 or 20%	4 or 80%	0
Negro	12	2 or 16.7%	10 or 83.3%	0
Over 24 Months				
White	6	2 or 33.3%	4 or 66.7%	0
Negro	15	2 or 13.3%	12 or 80%	1 or 6.7%

Results According to Ovarian Pathology

When the patients were grouped according to whether or not both ovaries were involved in an inflammatory process, the same parallelism was found. The negroes in general again show a higher percentage of symptoms. There were, however, relatively fewer negrores than whites having mild symptoms in the group with unilateral or no ovarian pathology. (Table IV).

Reaction To Bilateral Oophorectomy

Table IV. Grouping According To Ovarian Pathology

	No.	No Symptoms	Mild Symptoms	Marked Symptoms
Bilateral Ovarian Pathology				
White	8	3 or 37.5%	5 or 63.5%	0
Negro	22	4 or 18.2%	17 or 77.3%	1 or 4.5%
Unilateral, or No Ovarian Pathology				
White	11	3 or 27.3%	7 or 63.7%	1 or 9%
Negro	17	4 or 23.5%	10 or 58.8%	3 or 17.7%

Summary

During the period from January, 1923, to January, 1928, one hundred and twenty bilateral oophorectomies were performed at the University of Virginia Hospital, on women during their active menstrual lives. Of this number sixty-two, or 51 per cent, were followed by letter or visit. One was dead, and three proved not to have had complete operations. This gave a series of thirty-nine negroes and nineteen white. A study of their vasomotor and nervous reactions was made and the results grouped according to age, length of post-operative period, and extent of ovarian pathology. In this small series the negroes showed a slightly higher percentage of symptoms but as the number of cases has increased this difference has become less marked. It, therefore, seems probable that negroes react in general much as do whites to the total loss of ovarian tissue.

DENTAL SCIENCE VERSUS DENTAL PROPAGANDA.*

By JOSEPH HEAD, M. D., D. D. S., Philadelphia, Pa.

Decay is not a normal condition of the mouth. Cleanliness of the teeth and gums will absolutely prevent decay. Up to the present all methods of cleansing the mouth have been failures as they have not thoroughly removed the mass of infection from between the teeth and the surface of the gums.

It is beginning to be recognized that five or ten minutes a day properly expended will really cleanse the teeth and gums if the disease has not progressed beyond the superficial stage, and if the disease is within the possibility of actual contact of the toothbrush and the dental floss.

*Read before the Seaboard Medical Association of Virginia and North Carolina, at Washington, N. C., December 4-6, 1928.

XUM

The daily cleansings cause the gums to heal and render them less likely to receive infection in the future. In plain words, it is recognized that the principle discovered by Pasteur still holds, that infection can only occur in the presence of infective material, and that a clean tooth will not decay.

The film or scum that ordinarily collects upon the teeth and gums is not food deposit, it consists of masses of bacteria that attack the tissues, and if undisturbed, break down the vital resistance and form lodgements which send constant streams of poison and bacteria throughout the body.

Figure 1 represents two lower teeth at approximately the age of ten. The shading shows the healthy bone around the roots. The line A at the neck of the teeth shows the normal gum line. The space between the teeth and around the gum is clean because the dental nurse or mother of the child has used the dental floss to wipe out the space each day, and then the toothbrush to scrub the teeth and gums so that they are clean. If all the teeth can be kept as clean as shown in Fig. 1, decay will not occur, gum infection will be prevented, and the chances against rheumatism,

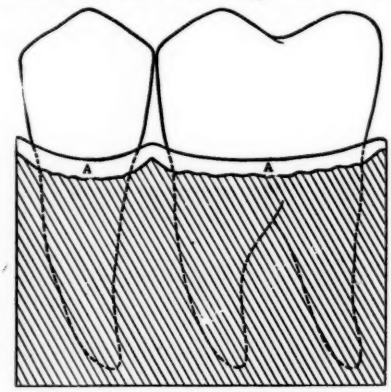

Fig. 1.—Shows two normal clean teeth. The line A represents the gum margin; the shading, the bony sockets supporting the teeth in the jaw.

heart disease, ulcer of the stomach, and many other fatal diseases will be reduced 50 per cent.

Figure 2 represents similar teeth in another child aged ten, where efficient cleansing has not been performed. The mass of small worm-like lines around the gum margins and the space between the teeth, represents the disease-spreading infection covering the gums that are now outlind by a dotted line. This mass at the exposed sides of the teeth can be cleansed by the brush, but the mass at B, between the teeth, can only be cleansed by dental silk, and unless dental silk is used daily and unless a small brush skillfully used scrubs the necks of the teeth clean each day, the gums and bone

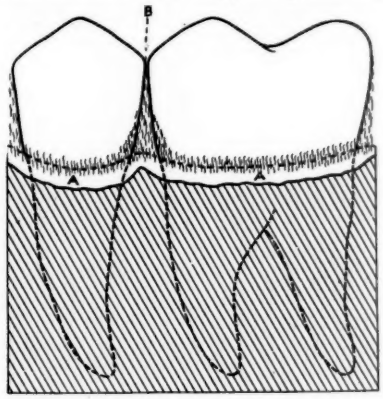

Fig. 2.—Shows the same teeth as in Fig. 1, except that they are dirty through lack of proper cleansing. The little worm-like lines represent the infection. Note the mass of bacteria in the space B that can only be cleansed by the dental floss.

will be progressively diseased as is shown by the following series of illustrations.

Figure 3 illustrates the condition of the gum and bone between and around the teeth at approximately the age of fifteen years when

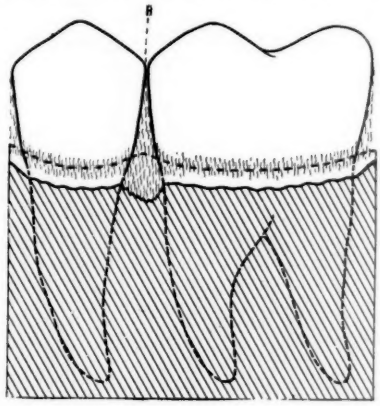

Fig. 3.—The beginning of a pyorrhea pocket starting between the teeth. Note the absorption of the bone at the bottom of the space B.

the infection between the teeth has been growing undisturbed for at least five years. This is the critical time for the health of the child's teeth and gums. Even yet, if the dental floss is ruthlessly swept along the triangle B, the

space between the teeth can be restored to health. The gums by this time are swollen and red, while the slightest touch to the tissue between the teeth will cause pain and a free flow of blood. The absorption and roughness of the bone between the teeth show the beginning of the infected spot that is to grow into a pyorrhea pocket.

The curative action of the dental floss is twofold. It mechanically removes the mass of infection, and it rubs the germs into the gums so that the tissues are stimulated to form a protective ferment that will destroy any individual germ that attempts further advance, and at the same time the ferment increases the resistance of the gums to any further infecting attack. In plain words, it vaccinates the gums.

Of course some infections are much more aggressive and poisonous than others, and therefore this crisis may come much more quickly to some teeth than others; it may come as early as twelve or as late as twenty-five years of age, just as there is or is not protective action of the saliva or of the tissues. When the infection has really become intrenched in the substance of the gum and bone, as in the triangle B, it penetrates with

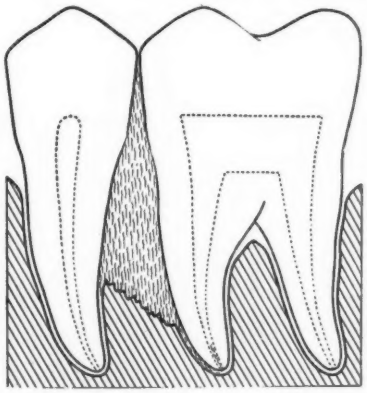

Fig. 4.—The further progress of the pyorrhea pocket which is now well established. The picture shows the cross-section of the teeth and gum. The outer bony plate has been removed, showing the bone only on the side.

great rapidity along the roots. This makes the much-talked of pyorrhea pocket. The gums on the sides being partly swept by the food, recede more slowly, so that external observation may reveal the gums at almost their normal size, while deep pockets may have formed as shown in Fig. 4.

Figure 4 is now drawn as a cross-section with the outer bony plate removed from the roots. Thus we can see the progress of the pocket beneath the gum as revealed by the area of little worm-like lines that even now have dissolved the bone and have worked along the root membrane of the molar, so that the nerve is beginning to be infected. There may be no decay in the crown of the tooth, and externally the tooth may appear quite normal except for a slight tenderness to pressure and an extra sensibility to heat or cold. Such a pocket may form here and there in the mouth where the infection has found exceptional opportunity for growth, while the gums on either side of the pocket may be as high as the gums shown on the outer sides of the teeth in Fig. 4. Such a pocket appears between the ages of twenty-five and forty years,

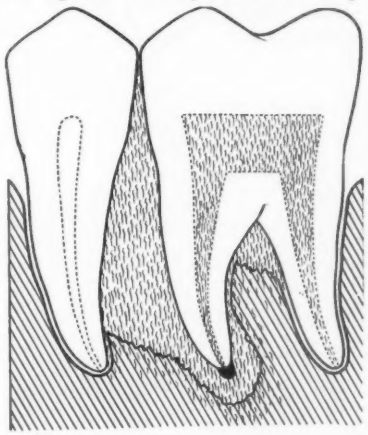

Fig. 5.—A fully established pyorrhea pocket with an abscess at the tip of the molar. The black spot represents the abscess.

and can only be cured by radical surgery and long treatment. But all of this destruction and toxic poisoning could have been prevented by the skillful daily use of the tooth silk and brush. The destructive enlargement of the pocket from now on is extremely rapid, as is shown in Fig. 5.

The bone around the tip of the adjacent molar root is completely diseased and is replaced by a spongy mass of infection. The germs have penetrated the tip of the molar root, destroying that portion of the nerve and causing the acute abscess sac to form, as is shown by the black spot. Thus we have a dead nerve in one root while the nerve in the other root is alive. The tooth is painful and

loose. Each time the tooth is used in chewing food the infected root is jammed on the spongy infection beneath, so that the poison and germs are driven into the bone substance, where the circulation carries them to all portions of the body to lodge and form new foci of infection.

Those portions of the body that have the weakest resistance receive this injected material, whether it be the joints, the heart, the stomach, the nerve centers, or the liver, and thus a tooth externally undecayed and apparently normal in appearance may be the cause of a crippling disease, and all because the teeth were not cleansed for a period of five minutes once or twice a day. It will be noted in Fig. 5 that the worm-like lines of infection have almost reached the tip of the other tooth.

Figure 6 shows a further progressive stage. One root of the molar has become absorbed and roughened with sharp, needle-like points, while abscess sacs have formed on the other two roots, so that all three of the roots during the process of chewing now act like pistons of a syringe, forcing the infection into the bloodstream. At first the body resists the poison, but as it is driven in day by day, week by

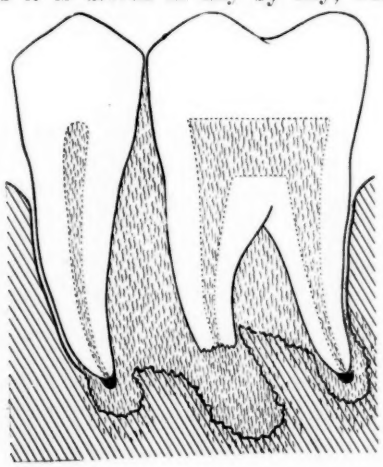

Fig. 6.—A pocket that is spreading infection to the other teeth.

week, year by year, the systemic health resistance is broken down, and the patient becomes permanently diseased. Such teeth at first may be sore or sensitive to cold or heat, but as the disease becomes chronic the pain disappears and the teeth seem almost normal in their functions. The greatest infection may come from a tooth that has become abscessed and apparently recovered, since the fact that a tooth is comfortable, normal in appearance, and useful for chewing food is no guarantee that it may not be the spreader of infection, which within a comparatively short time will cause crippling neuralgias or death-dealing abscesses in the vital organs of the body.

Fig. 7.—Teeth that have never been properly cleansed.

Figure 7 shows the mouth of a woman who did not cleanse her teeth and gums, and Fig. 8 shows the deformity of her hand which was typical of a disease that resulted in her becoming a complete cripple and led eventually to her death.

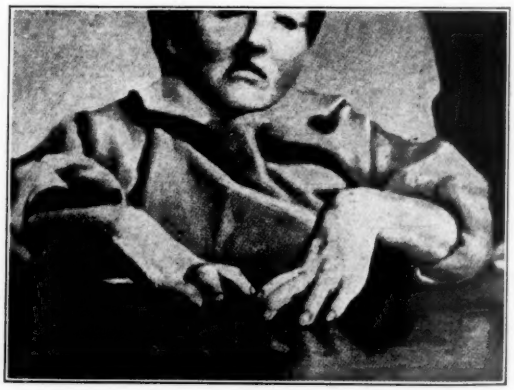

Fig. 8.—Deformity due to unclean teeth.

Let us again remember that this terrible source of disease would be eliminated by proper mouth cleansing. We have seen how the deadly pus pocket can form in the jaw bone when there is no tooth decay; let us now

examine how the same type of bone abscess can be formed by decay in the crown of the tooth.

Figure 9 shows two such cavities forming.

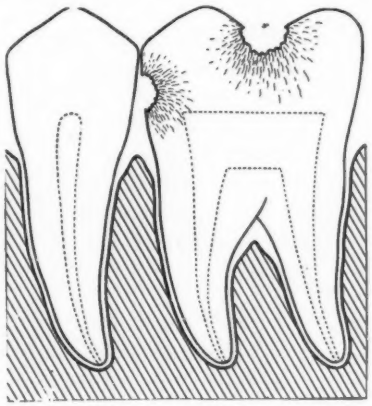

Fig. 9.—Spots of tooth decay due to lack of cleanliness.

Figure 10 shows a further progress of infection where the nerve is reached.

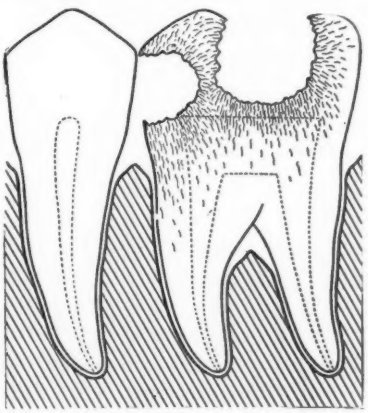

Fig. 10.—Tooth decay advanced to the point of nerve infection.

Figure 11 shows a putrescent nerve with the same type of bone abscess at the root tip as we have already seen in Figs. 5 and 6.

Cleanliness would have prevented all of this trouble. If the space between the teeth had been kept clean the cavity on the side of the tooth would not have occurred, and if the fissure on the crown of the tooth had been polished by the dentist so that food could not jam into it, the grinding surface would have been self-cleansing; thus the cavities would not have formed and the infection-spreading bone abscesses at the tips of the roots would have been prevented.

Thus we see how easy it is for a dentist and a patient to prevent decay before it starts, and how difficult, and finally how impossible, it is to remedy the trouble except by the extraction of the teeth and the scraping away of the diseased jawbone. This warns us not only to see that our teeth and gums are kept clean, it also urges us to visit the dentist so

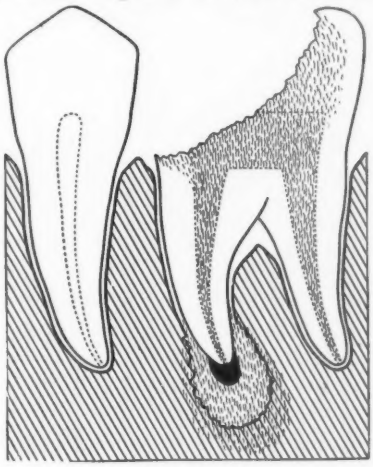

Fig. 11.—Tooth decay that has attacked the dental nerve and formed and infection-spreading bone abscess at the root-tip.

that any defects of tooth development may be remedied. For when that is done skillfully and the teeth have erupted so that they can be kept clean, thorough cleansing of the teeth and gums with brush and tooth silk will prevent mouth infection with all of its consequent systemic diseases.

Let us now consider the proper method of cleansing the teeth and gums: In a large majority of cases the pyorrhea pocket of infection starts between the teeth, and as the tooth silk alone can cleanse the tooth spaces, the efficient use of this important and much neglected agent of mouth hygiene will now be discussed.

Figure 12 shows the space between the teeth packed with a bacterial mass that is always present if the dental silk is not used properly. Dental silk heretofore has been supposed to be used solely for the purpose of removing particles of food from between the teeth, and while this is unquestionably imporant, it is far more important that the mass of bacteria shall be thoroughly removed before it can

gain lodgement in the teeth and the gum. But because the dental silk has been used solely with the idea of removing food particles, where food did not pack between the teeth the dental silk has not been used at all, and where it has been used it has been slipped in and out in a straight line to the gum, making only a cut in the bacterial mass as in Fig. 13, leaving the gum and tooth surface as much covered as before it was used. The silk when used should extend well around the contours of the tooth surface (see Fig. 14), for the bacteria are very adhesive and stick to the infected tooth and gum surfaces with all the tenacity of glue. No mouth-wash can kill or remove a mass of bacteria. It is, therefore, essential that the dental silk should be scraped along the rounded contours of the three sides of the triangular space between the teeth, so that only the slightest film of bacteria will be left. The mass of bacteria will come out on the tooth silk. It is particularly important that the mass of infection should be thoroughly removed from around the curving sides of the tooth so that the toothbrush can readily remove all of the remaining film, and so render the mouth free from masses of bacteria, for a thin film of germs cannot produce an amount of poison or acid sufficient to harm either the gums or the teeth.

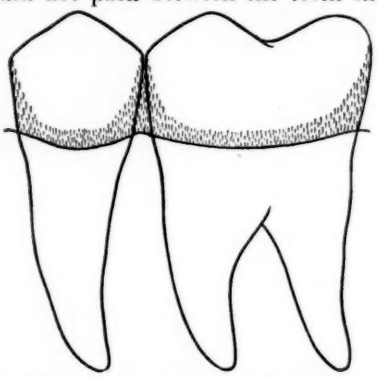

Fig. 12.—The small worm-like lines indicate the mass of infection usually found around or between the teeth unless dental floss and small toothbrush have been properly used.

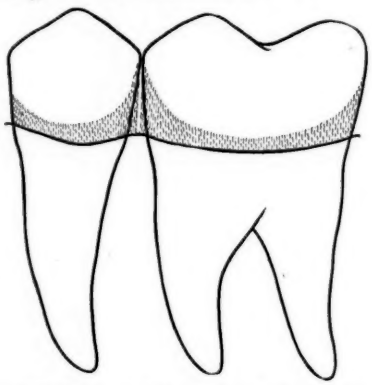

Fig. 13.—Bacterial mass between the teeth cut but not removed by the wrong way of using the dental floss.

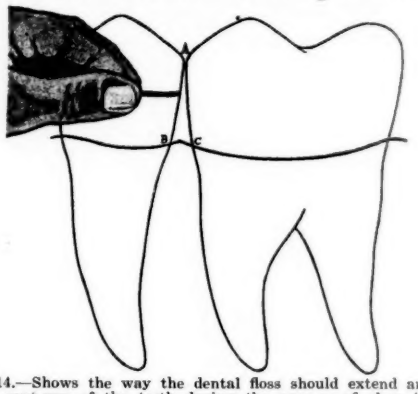

Fig. 14.—Shows the way the dental floss should extend around the contours of the teeth during the process of cleansing.

Figure 15 shows the space cleaned by the removal of the mass through its adherence to the dental silk. It will be noted that at the sides of the teeth near the gum a considerable portion of the germ deposit has been scraped away by the encompassing sweep of the silk. To make it quite simple, let the triangle, Fig. 16, represent the space between the teeth. The lins A-B and A-C represent the sides of the teeth. The line B-C represents the gum line between the teeth. The dental silk should start at the grinding surface A, scrape down to B, then scrape from B to C, and finally

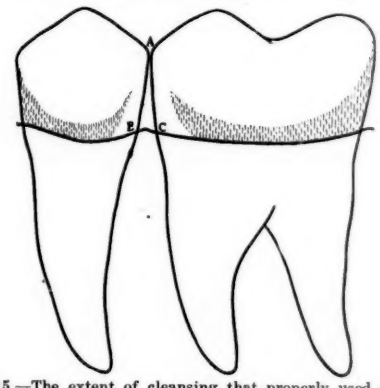

Fig. 15.—The extent of cleansing that properly used dental floss can effect.

from C to A, and out, carrying the bacteria away on the silk.

Properly used, the dental silk is far more important as a means of cleansing and preserving the teeth and gums than the toothbrush. When this use of the dental silk has been performed on all the tooth spaces, and

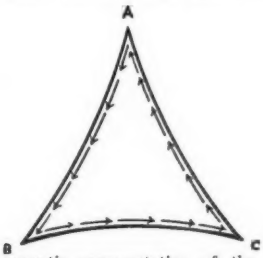

Fig. 16.—Diagrammatic representation of the space between the teeth. The arrows indicate the path which should be followed by the dental floss.

especially on the gum margins back of the back teeth, three-fourths of the bacterial mass in the mouth will have been removed, and the remainder can readily be cleansed by a small brush properly used.

THE LOOP METHOD OF FLOSSING TEETH.—Where there is much recession and loose folds of gum around the individual teeth, the loop method of flossing the teeth and gums should be used, as is shown in Fig. 17.

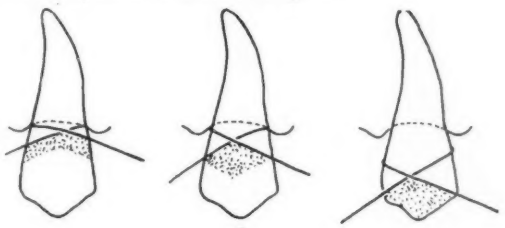

Fig. 17.—Loop method of using dental floss.

In a, Fig. 17, the loop is passed around the neck of the tooth and crossed so that it slips under the gum. The underneath string is then pulled so as to give the silk a sliding motion of about an inch, and then the loop is raised up by the underneath string and slipped over the crown of the tooth, sweeping the entire surface of its bacteria, as in Fig. 16a, b and c.

This is not an easy performance to execute efficiently so that the deposits will be thoroughly removed. The gums will bleed at first and will be sore for a period of ten days to two weeks, but a trial of this procedure during the time mentioned will give a feeling of cleanliness never before experienced, and the gums, ceasing to bleed, will become pink, firm, and comfortable.

Let us now consider the use of the toothbrush as a means of removing the bacterial masses from the exposed surfaces of the teeth and the gums. Just as those who never use dental silk never cleanse between the teeth, so do the great majority of those who brush the teeth never really cleanse them.

The brushing of the gums, as before stated, is of importance, but the intense pain occasioned by the first week's work is as severe as the pains in the back of an athlete when he first starts to get himself into condition. The trainer tells the athlete to go on with his work and that it will be all right, and in the same way the poor patient, though he fears that he is injuring his gums when he uses the brush vigorously, must be encouraged by his dentist to continue, with the assurance that the pain in his gums will soon disappear. The author once showed a young lawyer how to brush his teeth and gums. He went away and the next day the author received a letter from him threatening suit for having ruined his face. Amusing as this incident is, it has a very serious bearing. The gums, to be healthy, must be scrubbed so as to remove the bacterial masses, and also the dead epithelial scale, which will act as a bacterial food. Scrubbing infected gums cannot result at first in anything but further infection, that may, and frequently does, cause a slight fever, and yet the bacteria cannot be removed and the gums will not heal unless this severe ordeal is endured. The systemic reactions caused at times by brushing infected gums must be explained as a process of vaccination, for under no other supposition is it possible to explain why, under the newly inaugurated thorough brushing day by day, the gums should continue to be sore and inflamed, and then suddenly, between the seventh and tenth day, become healthy, hard, and firm, thereafter standing with complacency any amount of brushing.

The toothbrush should not be over 1½ inches long, the bristles not over ¼ inch long, and the handle long and large enough to afford a firm grip to the hand (Figs. 18, 19). The principal thing to be avoided is too great bristle length, since long bristles, by increasing the pivoting arc of each bristle, just so much

XUM

reduce the bristle friction produced by the general movement of the brush. It is bristle friction alone that cleanses the teeth and gums during the process of brushing. Bristles ½ inch long can pivot ⅜ inch each way without bristle friction. If, therefore, there is a 1-inch stroke, the bristle friction stroke is only

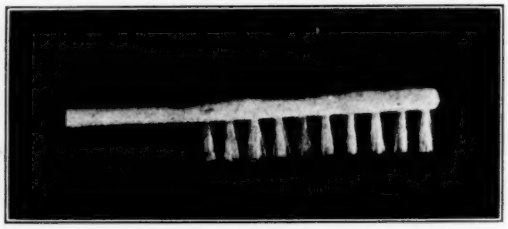

Fig. 18.—Actual size of brush that can properly cleanse the teeth and gums.

¼ inch, and if, as frequently happens, the toothbrush stroke is only ¾ inch, there is no bristle friction stroke at all. The ¼ inch bristle, under the same conditions, would have a play each way of 3/16 inch, which theoretically would cause only ⅜ inch loss of bristle friction, but, in reality, it would be less, since the further the bristle extends from the back of the brush, the more readily it bends under pressure. But granting that there was ⅜ inch loss in bristle friction to each stroke, this

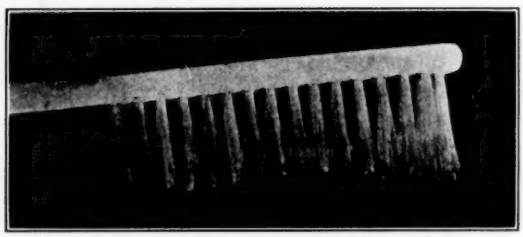

Fig. 19.—Actual size of brush ordinarily used.

would still leave a real cleansing friction stroke of ⅝ inch, when the 1½-inch brush was moved through a 2½-inch stroke, the amount of space for toothbrush motion usually found in the average adult mouth.

So much for the mechanics of toothbrushing; now as to the actual motions as applied to the human mouth. There are three motions: First, the rotary motion, whereby all the gums and teeth anterior to the second molars are cleansed with vigorous whirling action; second, the drawing motion, wherein the middle of the brush is placed behind the last molar and drawn vigorously across the outside gum margins of the teeth; third, the drawing motion, wherein the brush is placed back of the last molar inside of the mouth and drawn sharply forward along the gum margins and the teeth. In each stroke care should be used to follow the curve of the arch with the entire face of the brush.

After so much minute explanation it may not be inadvisable to review once more just what the daily cleansing of the mouth should be. The surfaces between the teeth should be thoroughly swept by dental floss to remove all food and bacterial deposits. The teeth and gums should then be thoroughly brushed, as described, with a gritless dentifrice or antiseptic mouth-wash, and the saliva and mouth-wash vigorously swashed in between the teeth for a period of not less than two minutes, so that the thin coating of bacterial film left by the dental floss on the sides of the teeth may be discouraged from growth until the next cleansing. Where there is marked gum infection a saturated solution of sodium silicofluorid or 1 or even 3 per cent peroxid solution should be held in the mouth for at least two minutes after the procedure just described. A pinch of bicarbonate of soda should be put into the peroxid solution before rinsing to insure its alkalinity. This cleansing should be carried out morning and evening. It must not be forgotten, however, that each mouth is a separate problem and must be treated as such. If teeth are missing, the brush must be inserted vigorously in the vacant spaces, and if certain abnormal rotations are necessary the dentist must train the patient to see that these abnormalities are met and the parts are thoroughly cleansed by especially devised strokes of the brush.

These principles of mouth hygiene have been recognized by educators for the last ten or twenty years. The dental clinics and mouth hygiene methods described and advocated by Wood and Rowell* show that various communities throughout the country are making a determined effort to start the children with healthy mouths. But these self-sacrificing teachers and dental nurses can only succeed if their teachings are backed up by the medical profession at large, and if they can obtain the intelligent cooperation of the parents.

Imagine the ordinary mother of six chil-

*See Health Supervision and Medical Inspection of Schools, Wood and Rowell, p. 232.

dren carefully supervising and if necessary personally cleansing 156 teeth a day, in addition to all her other maternal and household duties.

Imagine what chance a child has of being able to effectively cleanse its own teeth without supervision. Not one chance in the world. And ordinarily the mother doesn't know how to cleanse her own teeth, and if she does she usually doesn't appreciate its importance sufficiently to take the time to do it.

As one who has practiced dentistry forty years, and has during this time earnestly striven to advance the science of mouth hygiene, I find that not 50 per cent of my intelligent patients consistently keep their teeth decently clean. They fiddle with the toothbrush so that the front teeth appear clean if one doesn't look too closely, and they disclaim the use of dental floss by accusing it of pulling out the fillings that usually decay loose, because the dental floss is not carefully used each day. A large proportion of the physicians whose mouths I have examined do not know how to cleanse their teeth, and they also carry in their mouths non-removable, non-cleansable bridges, that are wholesale spreaders of systemic infection. If such ignorance exists among these cultivated intelligent patients, what can we expect of those children whose parents never use a toothbrush effectively, if they use it at all? When we can teach a fencer to fence by a correspondence course, when we can make a good swimmer of one who has never swum by merely describing the strokes, then we may hope to teach the children effective tooth brushing and dental flossing by diagrams and general class drill.

Up to the present time the task is too great for the number of workers in this field, self-sacrificing and enthusiastic as they are. If the campaign for mouth hygiene is really to succeed in stopping the general decay of the teeth with its secondary toll of deadly systemic disorders, we must have more enthusiastic educated assistance from the medical profession as a whole. The physicians as a whole not only ought to be able to say to their patients "cleanse your teeth"; they must as a class be able effectively to cleanse their own mouths. With this knowledge at their disposal they can intelligently recognize a dirty mouth when they see it, and then by their enthusiastic advice and demonstration they can instill similar enthusiasm into the mothers and fathers of families under their care. The physician alone has sufficient authority to create such necessary enthusiasm, and until his whole-hearted intelligent cooperation is obtained, the really fine organization for combating mouth infection and tooth decay that now is being perfected in this country will be like a beautiful electric engine that has everything but the power necessary to make it run.

So much for the dental science with which the title of this paper deals. We will now proceed to discuss the dental propaganda.

The country is at present being exploited by certain manufacturers of dentifrices and mouth washes to the sum of millions of dollars where extravagant pseudo-scientific claims are made of a therapeutic nature that lull the deceived buyers into a sense of false security. The complacent public is justly informed that the cause of tooth decay is bacterial film on the teeth, but the pseudo claim is that such and such and such a dentifrice or mouth wash will dissolve the film between the teeth by the mere act of rinsing the mouth with the mouth wash or of placing a small portion of the tooth paste on a toothbrush so that it can be rubbed in between the teeth. If such a mouth wash or tooth paste really existed it would surely be worth four times what they charge for it. But the most casual observations as well as the most thorough scientific tests show that these preparations do not dissolve the bacterial film and that the claims are absolutely without foundation. Extracted teeth immersed at mouth temperature in these miraculous mouth preparations for an hour still are covered by their original mucilaginous bacterial film and the same disheartening results are obtained when the wash is held in the mouth for from two to three minutes. The same with the bacteria-dissolving tooth pastes. The toothbrush cannot cleanse the interdental spaces, the dental floss alone can do that, and tests in the mouth and in vitro show that the dentrifices do not have the power to dissolve the bacterial masses and so remove the source of the disease. But these dentifrices have one property that is not dwelt upon in their advertisements. These dentrifrices may contain chalk or other substances which cut deep grooves into the necks of the teeth wherever these dentifrices are used consistently and plentifully for any length of time. The rea-

XUM

son more teeth are not injured by the grit is because the tooth brushing is ordinarily so casually performed.

Miller* as far back as 1907 pointed out the erosive action on the teeth of grits in dentifrices, and later experiments† have confirmed his findings and have proved that powdered chalk and precipitaed chalk when continuously used for tooth cleansing will wear away both enamel and dentine.

Of course tooth cutting grits are therapeutically unnecessary. This dentifrice and mouth wash exploitation is only less pitiful and harmful than the exploitation of those nostrums for the cure of cancer. In each instance the purchaser is lulled into a sense of false security until the disease has made irremediable headway. The cancer, if removed from the tissues at its first appearance, can be eradicated; if left undisturbed it soon cannot be cured. The same with the teeth. If the bacteria were only mechanically removed each day before they could form enough acid to cut the enamel, or before they could invade the gums, tooth decay and gum disease, as a scourge, would disappear. Clean gums and clean teeth cannot decay, and a thin film of bacteria cannot grow within twenty-four hours in sufficient quantity, to form enough acid to attack the teeth or to form sufficient toxins to break down the bacterial resistance of the gums.

Of course most manufacturers of these mouth preparations are desirous of being honest and of real service. They may not know that chalk cuts the teeth or even that the antiseptics in these mouth washes or tooth pastes can have no dissolving effect on the mucilaginous bacterial mass. There is for instance one tooth paste made up of magnesium hydrate. This has a mild bleaching effect on the superficial stains on the teeth and is antacid, and certainly cannot injure the enamel or dentine since it is entirely free from grit.

In conclusion I shall sum up with emphasizing the following points:

The cure for decayed teeth and infected gums is mechanical cleansing which must be obtained through the scientific use of the dental floss and small toothbrush. The methods by which this daily cleansing is obtained are most uninteresting, frequently painful and difficult to learn.

The general mass of physicians not being trained dentally cannot teach nor instruct the parents and without their cooperation the interest or understanding cooperation of the parents is impossible.

Peroxid of hydrogen, salt water or boric acid make excellent mouth washes that are valuable when used for a period of two minutes after the mouth has been mechanically cleansed. And finally, the public should be told that no mouth wash or tooth paste that claims to make mechanical cleansing unnecessary should be used unless it has had its claim passed upon by a competent therapeutic jury. And if such a jury is not now possible, the bewildered public should some time in the far future have the services of a competent body of physicians who will speak with unbiased scientific knowledge of the preparations they are prescribing, a body who will not have to gain their sole knowledge from the propaganda circulars of those manufacturers whose principal interest lies in increasing the sales of their products.

235 *South Fifteenth Street.*

*Miller: **Dental Cosmos**, Volume XLIX, page 246.
†Head: **Modern Dentistry**, pp. 62 and 63.

THE MEDICAL PROFESSION AND THE MEDICAL PRESS.*

By FRANCIS E. STEWART, M. D., Phar. D., F. A. C. P., Philadelphia, Pa.

I have the honor to address you as a member of the American Medical Editors' Association and Chairman of its Committee on Pharmacology and Therapeutics.

This Association was organized in 1869. Its first president was Dr. Nathan S. Davis, "Father of the American Medical Association". It has had a long and useful career under the presidency of leaders in medical science and practice whose names are familiar to you all. However, at the death of its last president, Dr. Henry O. Marcy, of Boston, an ex-president of the American Medical Association, and a distinguished member of the faculty of Harvard University Medical School, the Association became inactive because of the demands of the great World War upon its efficient secretary and many of its most active members.

Early in January, 1928, the American Medical Editors' Association was reorganized. H.

*Read by invitation before the Seaboard Medical Association of the Carolinas and Virginia, December, 1928.

Lyons Hunt, M. D., L. R. C. S., Edin., one of its old and active members, called a meeting of a few of the New York editors to discuss the advisability of its revival to life. The vote of those present was unanimous that it should be done.

Practically all the old members returned to the fold and more than two hundred more rallied to the flag; consequently, we have over three hundred members, not counting the members of the Medical Authors' branch which has recently been formed as part of the American Medical Editors' Association. The Association today represents practically every medical and pharmaceutical journal in America. Besides that, we have as over-seas members, the editors of the leading British medical journals, several of the French and nearly all of the Canadian.

Committees were appointed to study ways and means for solving many important problems relating to the medical profession in its relations to the public, as well as those pertaining more exclusively to medical and pharmaceutical journalism. These committees will report to the Association at its next annual meeting. Just how the Association will stand on these subjects will largely depend upon the information gleaned by the special committee appointed to study them.

The special subject for study delegated to the Committee on Pharmacology and Therapeutics relates to the question of cooperation between the educational and industrial institutions related to the materia medica and materia medica supply busintss, namely, the editors of medical and pharmaceutical journals depending for income to a greater or less degree upon advertising manufacturing houses engaged in the production and commercial introduction of alleged new remedies; authors of textbooks on materia medica, pharmacy, and pharmaco-therapy; lecturers and instructors on these subjects connected with the medical and pharmaceutical schools and colleges, publishing houses responsible for the publication of journals, pharmacopoeias and text books—all are responsible to the public for the service they are rendering—all are in partnership in rendering it. Attempts to dodge this responsibility are futile.

The President of the American Medical Editors' Association in a letter to me, made the following statements: "The American Medical Editors' Association should establish a laboratory, either through a corporation or stock company, the stock to be sold to physicians throughout the country, or else be the basis of a request for a foundation or an endowment so that this laboratory will be thoroughly able to function properly. The various pharmaceutical houses could, with advantage to themselves, subsidize this laboratory by yearly contributions. The laboratory would in no way be under the influence, the dominance or the dictation of special pharmaceutical houses, because in subsidizing this laboratory, they would be able to save many times the amount they could afford to give, by eliminating many of their own technicians and cutting down their own laboratory expenses, since this laboratory would be giving them an unbiased report on products they were thinking of manufacturing".

The President further stated that there could be no logical objection from any quarter to such a laboratory as such an institution would be solely for the purpose of supplying the manufacturer with data relating to a proposed product, so that the manufacturer would be in a position to either save money by either not manufacturing his product, where he found the data entirely against it, or should the data be in its favor, he would be in a better position to present his product to the Council of the A. M. A., as the data collected would be free from any commercial influence.

Now in regard to the character of the matter published in the reading and advertising pages of the medical and pharmaceutical journals, its object is for the most part to teach; and editors, publishers, and subscribers are equally responsible for what is being taught in either classes of pages. In fact, if possible, all are more responsible for what goes into the advertising pages than they are for what goes into the reading pages. I base this assertion on the fact that what goes into the reading pages is open to discussion. Not so what goes into the advertising pages. The publisher who permits the impartial discussion of the therapeutic merits of an alleged new remedy advertised in his journal runs the risk of a lawsuit for damages if he allows anything to appear in the reading pages that may injure the sale of the advertised product. The author of this paper can attest the fact from personal experience as an editor.

XUM

The President of the American Editors' Association also wrote me as follows: "If you wish to add anything to your paper regarding my personal opinion, you may include just what I have stated and you may also add that in the organization of your committee, I made only one request, that is, if a preparation were efficient, it was to be passed on favorably, regardless of the method of manufacture or who the manufacturer might be. This may come in conflict with our ethics which were established before the days of advertising, but my belief is that these ethics of three centuries ago are not applicable in this twentieth century."

The unsatisfactory state of affairs regarding the advertised remedies is set forth in the following "Preamble and Resolutions Adopted by the American Therapeutic Society, May 1, 1922:"

WHEREAS, the exact therapeutic value of new and even old drugs cannot be demonstrated owing to (1) the variety of names under which they are marketed; (2) the variation in their character, quality and strength due to different processes of manufacture; (3) the opprobrium of publishing in medical journals laudatory articles advertising commercially controlled drugs; (4) the fact that medical journals are unwilling to publish articles repudiating the therapeutic value of drugs, the advertisements of which are carried by them in their advertising columns.

WHEREAS, the large majority of practitioners of medicine and surgery find it impossible to remember or to take time to write long chemical names of drugs which have short, easily remembered names claimed as trademarks by their manufacturers.

WHEREAS, the constant use of a commercial name by physicians in prescribing and pharmacists in ordering supplies creates unfair monopolies in the sale of such drugs, to the discouragement of other manufacturers of the same products under their chemical names and hence, by destroying competition, removes the incentive to excel in the production of preparations of superior quality, therefore be it

1. RESOLVED, that the American Therapeutic Society herewith records its complete disapproval of all methods now in vogue for obtaining monopolies in drugs, vaccines and serums by product patents and the registration of so-called commercial names as trademarks; be it also

2. RESOLVED, that the American Therapeutic Sosociety herewith records its approval of, and that it will support, measures that aim toward the patenting of processes and apparatus for the manufacture of medicinal drugs, chemicals and preparations of the same when such products are in fact new and useful inventions, provided that a complete description of their chemical composition, method of preparation and standardization and tests for purity are made known in the application for patent in such clear and concise language that any chemical or pharmaceutical firm may manufacture and market said drugs; and

3. RESOLVED, that the American Therapeutic Society approves the patenting of new drugs under agreement whereby educational, research and eleemosynary institutions are licensed by the patentees or their agents or assigns to produce such patented products without royalty; and be it

4. RESOLVED, that the American Therapeutic Society also approves measures whereby the owners of such patents shall license the production of such patented products to competing manufacturers on a royalty basis; and

5. RESOLVED, that the American Therapeutic Society urges the cooperation of the medical profession, pharmacists, pharmaceutical firms, manufacturers of drugs, and editors of medical and pharmaceutical journals toward the end of appointing committees with power to promote such legislation as is needed to abolish the obnoxious and unscientific production, marketing and medicinal use of drugs, patented under the present laws; be it also

6. RESOLVED, that a copy of these resolutions be sent to the secretary of each national medical pharmaceutical association and to the journal of the American Medical Association.

This "Preamble and Resolutions" met with no response from the advertisers of alleged new remedies with one exception. You will note that the several solutions suggested by the American Therapeutic Society were based upon the abolishment of the product patent. What is meant by the product patent?

In most foreign countries, medicines are excluded from patent protection. However, in most such countries patents are allowed for processes and machinery for manufacture. In the United States patents are granted for foods, medicines, and chemical substances also for the processes and machinery for their production, thus creating monopolies for the products themselves These monopolies are usually under the control of business men who are not in harmony with the professional ideal of the medical fraternity.

The educational and industrial institutions related to the materia medica and materia medica supply business cannot work in harmony under a system of monopoly of products. Progress in the science of materia medica, or, in other words, the science of pharmacology, and in the useful arts of pharmaceutical chemistry, is dependent upon co-operate and coordinate research work on the part of the practitioners of these arts. There can be no cooperation under a system in which one party appropriates the results to the exclusion of the other. As things now exist, the knowledge resulting from the researches of men of science is immediately appropriated by the men of commerce for money making purposes to the exclusion of the men of science ofttimes without giving the research worker credit. For example, if a physician reports favorable

results in the therapeutic use of a monopolized therapeutic agent, the monopolist immediately reprints the report and uses it for advertising purposes. Or, again, if a medical or pharmaceutical practitioner discovers an improved process of manufacture, or a new product, it is appropriated without credit. The only way in which he can protect himself from such unfair competition is to patent the results of his researches. But the patenting of medical and surgical products is forbidden by the code of medical ethics. It is also forbidden for a physician to publish a report attesting to the therapeutic value of a monopolized product. The penalty for such a breach of ethics, is, in at least one State, automatic severance of relations with the county medical society.

As above stated, the sending out of its preamble and resolutions by the American Therapeutic Society met with no response with one exception. Mr. Milton Campbell, President of the H. K. Mulford Company, representing the board of directors, offered to license the production of products worked up in the Mulford laboratories to all competing houses in response to the extension of the same privilege by competitors to the Mulford house and other competitors. This plan, in modified form, was adopted a year later by the University of Toronto for the introduction of insulin to science and brands of the same to commerce. Further modifications of the license plan are in vogue, whereby, as in case of insulin, the censorship of therapeutic claims is under the control of disinterested committees.

In relation to alleged new remedies what is urgently needed by all concerned, physicians, pharmacists, producers and the public at large, is some method whereby their therapeutic merits can be determined before they are placed on the market for sale.

The Council on Pharmacy and Chemistry of the American Medical Association does not enter either field. Not until the producer has gone to the expense of getting the product in packages ready for retail sale or dispensing, including printed matter, does the Council deal with it. Then it assures itself that the producer has obeyed the rules of the Council—rules that are excellent and should be obeyed. But the field of the Council does not enter the field of therapeutics. As stated by its learned and efficient secretary, the Council cannot enter this field in regard to products advertised in the *Journal of the A. M. A.* without going into partnership with its advertisers and losing its judicial position.

Advantages of the Volunteer License Plan

The great advantage of the volunteer license plan is that it does away with monopoly, and, at the same time, protects legitimate professional and commercial interests and places the introduction of new materia medica products on a co-operative basis. The burden of expense is shared between the educational and industrial institutions; the artificial demand created by advocates of alleged new remedies is corrected by impartial discussions in medical societies and medical press. Brands are advertised in the advertising pages of the medical journals without endangering the integrity of the reading pages, and the more brands advertised the less the danger. These advantages may be summed up as follows:

1. It stimulates materia medica research and the publication of the results by donations to the professional societies and professional press, and thus increases the value of both as educational institutions.

2. The increased value of the medical journals as media for conveying knowledge concerning new products increases their circulation, and this, in turn, increases their value to the manufacturers of brands of the same as advertising media.

3. It stimulates competition between the manufacturers of brands to excel in quality of product. The license system insures common standards, yet quality of products made in accordance with common standards differs on account of differences in the skill of the producer.

4. The temptation to decry the merits of new products because of commercial rivalry is removed and desire to promote the investigation and use of such products is substituted for it because of the realizing sense that the introduction of each new product of therapeutic merit is profitable to all, as all are equally concerned.

5. It lifts the embargo on the medical press imposed by the monopoly system and permits the medical journals to impartially discuss the therapeutic claims for new products in their reading columns without fear of losing advertising patronage. For example, the advertising of brands of diphthera antitoxin in the

XUM

advertising columns of the medical journals has not hindered the impartial discussion of the therapeutic value of diphtheria antitoxin in the reading columns.

6. It permits medical scientists to enter the employ of the industrial institutions engaged in the pharmacal and pharmaco-chemical industries to do research work for monetary reward as well as scientific credit, thus encouraging them to choose research work as a vocation. Under the prevailing competitive system research work in commercial laboratories is discouraged.

7. It permits the medical and pharmaceutical schools and colleges to throw open their laboratories to research workers for solving problems of both scientific and commercial importance for the industrial institutions without danger of charges of collusion.

8. It places the faculties of the medical and pharmaceutical schools and colleges in position to teach their students knowledge relating to the more recent additions to the materia medica without the danger of unwittingly teaching errors due to commercial exploitation.

9. It creates a demand for departments in educational institutions for the teaching of pharmacologic science and the arts upon which that science is dependent to meet the requirements of the era of therapeutic renaissance now before us.

10. It creates a new and most promising field of work for the graduates of such institutions in the employ of industrial institutions carrying on their vocation in co-operation and co-ordination with the medical and pharmaceutical schools and colleges.

11. It places the pharmacal and pharmaco-chemical industries on a professional basis of such character that capital invested in research work may receive the protection afforded by the correct application of the patent and trade-mark laws without violating the ethical principles upon which the practice of medicine is founded.

12. And, finally, the plan is based upon sound business principles, is practical, is protective alike to educational and industrial institutions, protective to the medical and pharmaceutical press and its advertising patronage, and protective to the public health and general welfare.

235 *South Fifteenth Street.*

THE CONTROL OF CANCER.*

By W. C. CAUDILL, M. D., Pearisburg, Va.

When one considers the intensive scientific study that has been given to the subject of cancer during the past few years, the rapid and almost universal crystallization of the most effective methods of treatment, with regard to surgery, the X-ray and radium, the enormous amount of educational work that has been done among the laity, and at the same time notes that the death rate from cancer slowly continues to rise, he is at once made to realize that there is yet much to be done in this field.

It is true that by modern refinements of technique and improved methods of diagnosis, more cases of obscure cancer are now being brought to light than formerly. Yet, despite this fact, the consensus of opinion is that the death rate from cancer is on the increase. We do know that more than one hundred thousand lives are being taken annually in the United States by this dreadful disease.

The lack of knowledge of the real etiology of cancer and the absence of any universally effective cure naturally makes the control of cancer a most difficult problem. Certainly at this time no campaign comparable in results with that of typhoid, diphtheria and tuberculosis can be hoped for.

Yet, regardless of this fact, we know enough of the true nature of cancer, we have a sufficient means of diagnosis, and the present methods of treatment are quite adequate to lower definitely and materially the death rate of cancer if only the knowledge we have is made use of in the wisest manner and to the fullest extent.

The American Society for the Control of Cancer has undertaken the Herculean task of "leading a movement to reduce the amount of suffering and death from cancer in the United States and Canada". A wonderful ideal indeed. To accomplish this aim, the Society is working with two main objects in view:

1. "To teach the public the earliest danger signals of cancer, which can be recognized by persons without especial knowledge of the subject, and to induce the laity to seek competent medical attention when any of these indications are believed to be present."

2. The physician or surgeon when consulted

*President's address delivered before the Fifth Annual Meeting of the Ex-Interns' Association of St. Elizabeth's Hospital, Richmond, Va., October 2, 1928.

must make a prompt and accurate diagnosis, and institute immediate treatment.

If the campaign against cancer is to be crowned with results, it must, like any successful political campaign, be obtained through a wise, extensive and complete organization. The society has effected such an organization and already millions of people have been taught how to recognize the early signs of cancer, and the danger of delay in applying for treatment. On the other hand, there are many sections throughout the country into which the campaign has not yet been carried, where reside thousands of people who are still in total ignorance and darkness in so far as knowing what could be accomplished by the early recognition and treatment of cancer. To these people the gospel of light and hope is yet to be carried.

About two years ago I was called to see a patient in one of the more isolated sections of my county who was suffering from an inoperable cancer of the breast which had already metastasized to the liver and lung. When asked why she had not sought the advice of a physician earlier, she replied that she thought it was only a "waxen kernel" that had come as the result of a mosquito bite. Another patient who was examined in the office was found to be suffering from a well-advanced case of carcinoma of the cervix. She returned home to make preparations to enter the hospital at once. Several of her neighbors upon learning that she had cancer advised her to have nothing further done whatever; it would be no use if she had cancer. She returned, however, in spite of their protest, and is now apparently cured. I recite these two cases to emphasize the importance of extending the educational campaign into every city, town, county and hamlet throughout the entire country.

The efforts of the Society thus far have not been fruitless. The Pennsylvania Cancer Commission reports that "thirteen years of education have cut down the average time between the discovery of the first symptoms in superficial cancer and the first call on the doctor from eighteen months to fourteen and six-tenths months, or 20 per cent. In cases of deep-seated cancer the interval has been reduced nearly one-half. And in these thirteen years, the doctors of Pennsylvania have learned the importance of prompt action sufficiently to have reduced the interval between the patient's first appearance and the institution of the treatment required from thirteen months to four and one-half months, or 65 per cent, in superficial cancer, and from twelve months to three and nine-tenths months, or about 70 per cent, in deep-seated cancer". The results noted in Pennsylvania can be obtained in every state in the nation if the campaign is prosecuted with the same vigor and determination.

The vital importance of educating the public cannot be over-estimated; but it is upon the shoulders of the physicians themselves that rests the greatest responsibility of all. About 10 per cent of the doctors of the country must face the serious charge of not instituting early treatment even after the patient has applied. It is hard to believe that any doctor who has graduated from a recognized medical school and passed the State Board examination would advise a woman with breast cancer to "wait until it begins to bleed and then come back and I will tell you what to do", or a woman bleeding from a cancerous uterus that she "had a cold in the pelvis", and another case of cancer of the rectum "that his bleeding was from a rupture", and a truss was prescribed.

We must admit, even with all our modern methods of diagnosis, that many of the internal cancers are most difficult to recognize in time for early treatment; but there are present in almost every case symptoms that would give rise to a suspicion of cancer, and we should not hesitate to refer these cases to those best qualified for making a diagnosis. It is well always to bear in mind that cancer of the stomach and liver is the most important form among men, that nearly one-half of the total cancer mortality among males is of these organs, and that one-half of the total cancer mortality among women is of the breast and genital organs. Every physician should be thoroughly familiar with the earliest symptoms of cancer of the stomach, and always be on the alert to suspect its presence. We must ever remember "that if cancer is to be treated successfully it must be treated early".

My appeal to the medical profession is to get behind the movement for the control of cancer with its most earnest and whole-hearted support and cooperation, with the confident hope in view that, when this is done in deed

XUM

and in truth, suffering and death from cancer will be greatly reduced.

THE PRESENT STATUS OF THE DIAGNOSIS AND TREATMENT OF DEAFNESS.*

By M. L. BREITSTEIN, M. D., Baltimore, Md.

In a consideration of the present status of the diagnosis and treatment of deafness, we may say with pardonable pride that in no time in the history of otology has there been such a widespread scientific approach to the investigation of deafness as now exists. This happy condition is due largely to the efforts of the American Otological Society and to the hearty cooperation of our large Foundations, as well as to the interest of the government through the Department of Education.

I am sure it is not necessary to emphasize the seriousness of this problem. I need only to call your attention to the fact that recent investigations among public school children tend to show that at least 14.4 per cent of the school population are suffering from defective hearing. Translated into numbers this means over three million school children in the United States.

As a hearing mechanism, the ear may be divided into the sound conduction apparatus and the sound perceiving apparatus. The external and middle ear serve as the conducting mechanism while the internal ear, that is, the cochlea and the auditory nerve endings, are the sound perceiving mechanism. Accordingly, the localization of the lesion determines whether there is a conduction deafness or a perception deafness. Indeed, conduction lesions are called middle ear deafness and perception lesions internal ear deafness. Without going into too great detail concerning the differential diagnosis of deafness, it may be said that the typical conduction apparatus impairment usually shows the following: diminution in hearing for low tones, lengthened bone conduction, and a negative Rinné (that is, bone conduction is better than air conduction, which is just the reverse of the normal finding.) In perception deafness we are more likely to find shortened bone conduction, reduced hearing for the high tones, and a positive Rinné.

*Presented at the fifth annual meeting of the Ex-Interns' Association of St. Elizabeth's Hospital, Richmond, Va., October 2, 1928.

You are all familiar with common forms of otitis externa, as well as the catarrhal and purulent affections of the middle ear associated with nose and throat disorders and also with the infectious diseases of childhood. It may not be out of place to remind you that it was as recent as 1870 that Wilhelm Meyer, of Copenhagen, published the first work on the effect of the removal of adenoid growths in the nasopharynx as a factor in reducing serious impairment in hearing. At the time of his writing it was estimated that cases of serious deafness in the young were reduced about 60 per cent over former years. Recently, there has been much important emphasis on the relation of nose and throat pathology and ear disease. Happily, the time is already here when the physician regards with proper seriousness repeated earaches and persistent ear discharge.

Aside from the essential nerve deafness such as that which complicates meningitis, syphilis, parotitis—there is another form of internal ear disease which has its beginning and is always confined to the bone surrounding the end organ of the auditory nerve. It is the belief of many that these bone conditions, somewhat analogous to osteo-porosis, develop from constitutional causes as yet obscure. Otosclerosis is the commonly accepted term for this condition. We do know that it is hereditary, that it affects women more often than men, that it usually becomes clinically manifest in early adult life, and that it is aggravated by pregnancy. In addition, there are undoubtedly cases in which the disease has its beginning in the middle ear but in association with which there is to be found involvement, either resultant or concomitant, of the internal ear.

There was a time, and that in the not distant past, when otologists serenely assumed a fixed correlation between the tuning fork tests and ear pathology. As recently as 1923, there was published an elaborate chart into which chronic catarrhal otitis media, chronic purulent otitis media, otosclerosis, otosclerosis with nerve deafness, peripheral nerve deafness, and central nerve deafness were differentiated and snugly fitted in accordance with the tuning fork tests. At the present time we are not quite so certain about the interpretation of hearing tests; for strange things are being reported. For instance, shortening of bone conduction has always been regarded as evidence

of nerve deafness and yet one author has observed that shortened bone conduction may exist for years and after treatment, in some cases, be partially restored. It was also observed that the conduction apparatus may be impaired by the loss of the drum, malleus and incus and epidermization of the promontory—and yet the hearing may be but little impaired. In a very careful and exhaustive study of the tonal ranges in lesions of the middle ear, an analysis of the clinical charts of twenty-two cases of acute otitis media showed that in every case except one, there was either decreased bone conduction, lowering of the upper tone limit by bone conduction, or a defect in the audiometer curve which was suggestive of a nerve lesion. There was no definite relation between the severity of the middle ear infection and the nerve lesion for—and this is of particular interest—when the middle ear infection was unilateral usually the unaffected ear also presented evidence of a nerve lesion. In every case of chronic otorrhea except one there was evidence of a nerve involvement; and contrary to the acute infections, there was an interdependence of the middle ear lesion and that of the nerve. These and other reports from reliable observers have complicated the interpretation of hearing tests.

Unfortunately, hearing tests must necessarily deal with the subjective element and consequently due allowance must be made for this fact. Tuning forks have been the most reliable method of qualitative testing. However, with the tuning fork there has always been the question of standardization. Dr. A's tuning fork test did not necessarily agree with the test of Dr. B. For many years there was a standing committee in the American Otological Society on the standardization of the tuning fork test. Various and sundry methods were advocated but there was always some difficulty which was not overcome. Quantitative testing with tuning forks was also attempted. Perhaps one of the best methods advanced was that of comparing the patient's hearing with that of the examiner—with the assumption that the examiner's ears were normal. By this method it was hoped that we could approach the ophthalmologists x/20 vision test with an x/20 hearing test. I need not enter into the physical pitfalls of such a procedure. So the problem of the standardization of hearing tests and the problem of a really worth while quantitative test remained. In addition there was another problem of vital importance—namely, the detection of slight loss of hearing.

About 1915 an otologist and a physicist—an extremely appropriate combination—got together on these problems. After much labor they perfected the Iowa pitch range audiometer—an instrument by which the tuning fork tones were electrically produced and the intensity of the tones exactly controlled by electricity. The instrument was not ideal—but the fundamental method of solving the problems had been discovered. While these men were working upon the perfection of their instrument, along came the Bell Telephone and the Western Electric Companies with an audiometer developed in their laboratories—and it is a real solution of the hearing test problem. With this instrument, tones from 32 to 32,000 double vibrations per second are produced and the intensity is electrically controlled. From the tests of a large number of people they have established a norm—so that it is possible to chart a hearing curve and also to calculate the percentage of hearing loss.

The pathology of external and middle ear disease is rather well understood. When, however, we come to the pathology of the internal ear we are breaking new ground. I do not mean that work has not been done. On the contrary, continental laboratories, particularly the Viennese, have published a great amount of work. However, there has not been a satisfactory correlation between the clinical findings and the pathology. In fact, the very pathological findings themselves are still in a stage of questionable interpretation. When we consider the difficulties in obtaining temporal bones without incurring the danger of post-mortem change, the difficulty of removing the specimen without injury to the delicate internal structure, and the many difficulties in preparing the specimen—the proper decalcification of which alone takes about two months—for microscopical examination, perhaps we will not be too severe in our criticism. The chief problem of the ear pathologist at present is the obtaining of a sufficient number of serial sections of normal internal ears—sections which are above any suspicion of artefact and which are suitable for study under the highest power lens. When this has been done, then and only then can we speak

XUM

with any authority about pathological findings. In order to accomplish this, and also to insure some correlation with clinical data, ear laboratories have been established at several centers. As many temporal bones as possible are being sectioned. Along with this the complete clinical history and examination, including a complete hearing test, is filed. You will agree that this is a stupendous program, and surely many years will be required before real results are obtained.

We come now to the treatment of deafness. Fortunately, much can be done with many cases if they are seen early enough. On the other hand, there are too many cases of deafness which distressingly remind us that our progress has not been sufficient. With your permission I shall now digress from the subject of this paper to dwell somewhat upon the responsibility of the physician to these deafened individuals.

The conscientious physician recognizes the limitations of medicine in the treatment of these cases, and we very properly praise his honesty in dealing with his patient. However, it is at just this point that too many physicians feel that they have discharged their entire responsibility to the patient. It is perfectly possible for a competent otologist, after a proper examination, to determine whether the deafness is curable or not. It is also possible to prognosticate fairly well whether the deafness is of a progressive nature. Having made the proper examination and having determined that the deafness cannot be helped, can we conscientiously feel that we have done our duty as physician to the patient by saying, "I am sorry, but there is no cure for your deafness?" Can we complacently wait until medical science discovers a cure? Perhaps in no other field has quackery had a wider fling, and I suspect it is very largely due to the laissez faire attitude of physicians who, in too many instances, discharge their responsibility by pronouncing the deafness incurable.

What, then, is to be done with these incurable cases or with those cases in which we feel that the deafness is progressive? The proper guidance at the proper time may very well mean all the difference between an ultimately useful member of society and a most difficult social and economic problem. To give false hope of cure, to equivocate for a long period of time, is nothing short of criminal. We all know that psychologically there is no class of individuals who are more susceptible to suggestion than is the deafened. This weakness is too frequently played upon to the ultimate injury of both the patient and the doctor.

There are two means of attack. The first is the early recognition of progressive deafness and the immediate treatment of it as such. The second is the realization that we have to look for help beyond the armamentarium of medical treatment to the realm of education. We are considering now the deafened—that is, those individuals who have once had the hearing faculty, in contra-distinction to the deaf who have never had the faculty of hearing or who have lost it at such an early stage that they have not become acquainted with the spoken voice.

First, then, as to the early recognition. If progress is to be made in the prevention of the commonest types of deafness, the problem must be attacked at an earlier stage than has as yet been recognized. It soon becomes apparent that in order to accomplish anything in the early detection of deafness, we must enter into the sphere of public health. The routine examination of hearing in school children suggests itself as a possible and effective check.

Slight degrees of deafness in children, and in adults as well, cause much less disability than slightly defective vision, and for this reason it is more easily overlooked. Up until very recently the progress in rendering proper medical and educational treatment has been hampered because of the inadequate means of detecting slight hearing defects. As I have told you, this has now been overcome. By means of the recently developed 4-A or phonoaudiometer, standardized voice tests can be given to forty children at one time at the rate of 100 to 150 in one hour. This is an instrument by which the sounds from a phonograph record are transmitted electrically to adjustable ear phones. In this way one can check up on those children who fail in the whisper test. Those who have failed in this test are then tested individually, preferably with the 2-A audiometer, and those showing a hearing loss of 25 to 30 per cent are referred to the health department for special medical examination. This presents a rough outline of the method of attack from which I believe the greatest success can be obtained in the early

recognition of deafness. To be sure there are many difficulties. There is the difficulty in persuading the parent to allow the child to be brought to the clinic for treatment. There is the additional difficulty of impressing upon the parents the need of treatment when apparently the defect is so slight. However, while it may not be possible at present to discover every child who is in need of either medical or educational treatment, at least some such program would probably insure effective strides in that direction.

We come now to the second step. Having found that a certain number of the children who have had special medical examinations are incurably deaf or that the deafness is of a progressive nature, what is to be done? The problem now becomes entirely educational. The interesting thing about the educational movement, interesting and at the same time a rather sad commentary, is the fact that the movement was not started by physicians, but by the deafened people themselves. It is the general concensus of opinion that, for the deafened, education in lip reading offers the best hope. Lip reading is a comparatively new study. It was not until 1900 that it was brought to this country from Germany. However, from three private schools originally founded in Boston, New York and Philadelphia, this form of education has spread, so that teachers are to be found in most large cities. In Germany the need of this particular form of education was recognized in 1902 and instruction was given in all schools. In Austria, Holland and Switzerland lip reading has been long established as a recognized treatment of the incurably deafened. In Vienna the teaching of lip reading is combined with the vocational training, so that by the time the child graduates from school he is a useful citizen and is thoroughly at home in the normal hearing world.

The progress in the United States in the past few years has been very encouraging. In practically all the large cities in this country classes are being constructed for the deafened child. In these classes instruction is given by a visiting teacher for two half-hour periods a week. It is important that the child be kept in a normal atmosphere, and that he be allowed to progress as fast as he can with his normal brothers and sisters. Segregation should be avoided, and the aim should be the restoration of these children to society as quickly as possible. The psychology should be that of making the child feel that he is getting special help in his education rather than to let him suspect that he is segregated because of his deafness. In modern education this sort of procedure should be perfectly possible. Not more than five children should be taught in one class for a period of not more than half an hour twice a week. The work constitutes the training of the eye in quickness and accuracy, and also training the mind to concentrate in detecting the movements of the lips in speech and translating them into thought. This is done through drill words, sentences, stories and various devices. It is evident that the teachers who handle these classes must be especially trained for this type of work and in addition should have the normal or regular college training required by the school department. At present there are two universities, Boston University and Johns Hopkins, in which there are courses for training teachers to conduct the lip reading classes. There should be more of these courses available.

I have given this brief summary of what has been done and the direction in which I believe the movement must go if we are to expect results. There must be a close alliance between the health and the educational authorities. As physicians, we must change our attitude of hopelessness towards the deafened who cannot be helped by medical treatment. We must be particularly careful in our diagnosis, to be sure, but, above all, we must realize that the rendering of a diagnosis alone does not constitute the whole responsibility of the physician to his patient.

DOUBLE ECTOPIC PREGNANCY.*

By H. H. HARRIS, M. D., Anderson, S. C.

L. P., colored, age thirty-three, married at fourteen years old, but did not begin having children until twenty years of age. She had three children about two years apart, and all births were normal with the exception of the last one, which was a prolonged labor. She had a slight septicæmia and was in bed three weeks. Then she began having miscarriages which averaged about five and one half months. She had seven in all over a period of six years.

*Presented at the fifth annual meeting of the Ex-Interns' Association of St. Elizabeth's Hospital, Richmond, Va., October 2, 1928.

XUM

In February, 1928, after missing three menstrual periods, she was seized with acute abdominal pain, fainting spells, and some wasting from cervix. After three days illness her physician called in another physician who did a D and C operation on her. He found but very little material in her uterus, so he packed with gauze and mercurochrome to stop her bleeding. She had a typical septicæmia following all of this and was sick three months in bed. She ran a temperature for six weeks. Ever since this attack she has had much pain in right lower side of abdomen, worse at her menses, and would often faint on first day of her menses.

On July 4, 1928, she was brought in to the A. C. Hospital, having been sick ten days with acute pain in abdomen and many fainting spells. She was in a light shock, temperature 101, respiration 24, pulse 110. Her blood count was 14,000 whites and 80 polys. She had missed two menstrual periods.

Vaginal examination showed uterus enlarged and soft, with mass in right side and no discharge from cervix.

Operation: Diagnosis made:—probable pus tubes.

Lower median incision was made in abdomen. Free blood was found with many dark clots. Her left tube showed a recent rupture of a fetus about eight weeks. This tube was removed.

Her right tube and ovary was one mass, resembling a pus tube with adhesions. This tube and ovary were removed in a mass. Drainage was done to pelvis by two tubes and abdomen was closed with catgut, silk worm gut, and linen. Patient made an uneventful recovery.

The mass that was removed was opened after the operation and was found to contain the bones, etc., of a fetus about three and one-half or four months.

I saw the patient September 28th and she was in perfect health. She was menstruating every twenty-eight days, and had gained twenty pounds in weight—back to what it was one year ago before all this trouble started—and had had no more fainting spells.

We can't have an expansive stretch of healthy life without an expansive sweep of the mind. Littleness of mind, jealousy, envy, the tendency to gossip, looking for the faults rather than the good traits in others, all have their adverse stultifying, dwarfing influences.—*Selected.*

THE MEDICAL ASPECTS OF ABDOMINAL PAIN.*

By BLANTON P. SEWARD, M. D., Roanoke, Va.
From the Medical Department, Lewis-Gale Hospital.

Pain in the abdomen is probably the chief complaint of the majority of patients. When a person complains of abdominal pain all possible causes should be considered by the physician before treatment is begun. In some instances the cause is readily recognized as surgical and an operation is advised. There are many patients, however, in whom the cause is not readily determined. In these the symptoms and signs are confusing and require close observation and analysis before a diagnosis can be made. In a large proportion of patients in this class operative treatment will eventually be necessary, while, on the other hand, a number of patients will have some medical condition in which surgical procedures are contraindicated. The medical aspects of abdominal pain is, therefore, a subject of great importance and may be discussed with profit in a meeting of practitioners of medicine.

The greater number of abdominal cases are first seen by the medical man. It is he who first examines the patient and who decides whether a surgical consultation is needed. The medical man should strive to develop in himself to the highest possible degree that indescribable quality known as good surgical judgment; he should endeavor to make the same quick, accurate diagnosis that the surgeon makes. There are many cases in which the medical man's judgment is fallacious; he may recommend an operation without having considered all of the possibilities, or overlook an acute surgical emergency when delay in operating may result in a fatality that might otherwise be averted. He should endeavor to keep abreast of advances made in diagnosing not only abdominal lesions but also lesions elsewhere of which abdominal pain may be the first symptom. Witnessing operations and autopsies has proven invaluable in correcting many diagnostic errors.

It is not the purpose of this paper to discuss all of the causes of abdominal pain for they are legion, nor even those which are recognized as surgical at the outset, but rather to mention a few diagnostic pitfalls the medical man should bear in mind; also, a few

*Read at the meeting of the Staff of the Roanoke Hospital, January 3, 1929.

points which will often aid in arriving more quickly at a diagnosis.

The most frequent extra-abdominal lesions causing pain in the abdomen are those occurring in the chest, as cardiac lesions, pneumonia and pleurisy; those occurring in the spinal column, as hypertrophic spondylitis; diseases of the spinal cord, as tumors and neurosyphilis; affections of the sensory nerves supplying the thoracic wall, as herpes zoster and intercostal neuralgia. Intra-abdominal conditions as duodenal ulcer, colitis, hepatic carcinoma, lead poisoning, and intestinal parasites having pain as the objective symptom should be borne in mind, as the pain may signify some definite changes in the organs, pathologic or functional. It may also denote a changed relationship of the organs to adjacent organs, as in visceroptosis. In addition to these, it should be remembered that diabetic coma may be ushered in with abdominal pain, nausea and vomiting; and that abdominal pain may be the precursor of uremia. We must not overlook the fact that the predominating symptom of influenza occasionally is severe abdominal pain.

When the pain of coronary thrombosis is confined to the epigastrium, the close similarity of the symptoms with those of acute surgical lesions causes great difficulty in the differential diagnosis. The distinguishing features are a persistent pain of varying severity, not readily relieved by the nitrites or morphine, with associated changes in the heart sounds, a rapid fall in arterial tension and the development of pericardial friction. The diagnosis can only be made by a detailed consideration of the age, history, physical findings and close observation of the patient, particularly of the heart sounds and blood pressure readings. These observations are within the scope of every practitioner. The electrocardiograph renders valuable assistance in clarifying the diagnosis between this condition in which serious cardiac injury occurs and a surgical emergency demanding immediate intervention. It may render greater service in cases presenting symptoms of a milder degree than such as are usually ascribed to coronary thrombosis. The value of electrocardiography in suspected cases of coronary thrombosis is in demonstrating changes in the ventricular complex of the electrocardiogram occurring coincidentally with or soon after the onset of the symptoms.

The differential diagnosis between pneumonia and acute appendicitis is a matter of great importance. Confusion is likely to arise in those cases of pneumonia in the right lower lobe, which begins with pain in the right lower quadrant of the abdomen. A considerable amount of muscular rigidity may accompany the pain, and the possibility of pneumonia overlooked. When pneumonia is the cause of the pain the respiration rate will be increased and the temperature higher. A careful examination of the chest will often reveal restricted expansion in the right lung, with slightly impaired resonance over the lower lobe, diminished breath sounds, and possibly a few crepitant rales. Cough should be noted. A high leucocyte count favors pneumonia. X-ray of the chest should be made when possible.

Diaphragmatic pleurisy must be differentiated from acute surgical conditions in the abdomen, such as appendicitis, cholecystitis, peritonitis and sub-diaphragmatic inflammations. In diaphragmatic pleurisy, pain or tenderness in the neck or shoulder on the same side is often found. A painstaking physical examination may reveal a diminution in the intensity of the breath sounds, and the relief of pain afforded occasionally by strapping the chest is in contrast to increased pain on pressure over an acute appendix or gall-bladder. Even when the few signs indicate that the patient's lesion is thoracic, one may be in doubt as to whether there may not be appendicitis as well. Acute pleurisy, for instance, may result from an extension of the infection along the posterior abdominal wall. It is only by careful judgment that a decision may be reached.

Herpes zoster should always be borne in mind when unilateral pains without objective signs occur in the abdomen. Herpetic pains on the right side of the abdomen may not be confined to the upper or lower quadrant but may be referred in such a manner that renal colic is simulated. The diagnosis is made after the vesicles appear. When the eruption does not appear the diagnosis is almost impossible, though trophic disturbances may suggest herpes.

Intercostal neuralgia may be diagnosed by the presence of tender spots along the intercostal nerve, by the absence of symptoms and signs of organic disease in the abdomen, and by frequently finding a focus of infection.

XUM

Hypertrophic spondylitis causes pain which may be referred to the abdomen. Spondylitis is most commonly found in elderly people and is associated with the common symptoms of stiffness, painful body movements, lumbago and sciatica. The flexibility of the vertebral column will be found to be diminished, and X-ray or the vertebrae will show bony proliferation or absorption of the lime salts and narrowing of the intervertebral spaces.

Spinal cord tumors located in the lower thoracic segments and impinging upon the posterior roots may produce severe pain simulating local abdominal disease. The pain may persist for months, but the general symptoms of peritonitis are absent and sooner or later other signs of cord tumors develop, as paraesthesias, motor weakness, spasticity, and areas of anaesthesia and hyperaesthesia.

The gastric crises of tabes dorsalis may be attended by severe epigastric pain. Characteristic features of neurosyphilis are the sudden onset of pain of a few minutes' duration, and absence of the deep reflexes, Argyl-Robertson pupil, pains in the lower extremities, locomotor difficulties, and mental disturbances. Examination of the spinal fluid will show a positive Wassermann, a colloidal gold curve of the paretic or tabetic type, and increased globulin.

The classic duodenal ulcer syndrome includes a history of epigastric pain that has come to be known as a hunger pain. Pains due to chronic appendicitis and chronic cholecystitis may also be of this character, but the ulcer patient will more frequently show a higher percentage of free hydrochloric acid. Intervals of freedom from symptoms, or remissions, is characteristic of duodenal ulcer. The X-ray will prove the diagnosis in nearly all cases.

In visceroptosis a burning sensation in the epigastrium often occurs two or three hours after meals and is relieved by food. A carefully taken history will reveal other uncomfortable sensations, backache, fatiguibility, sometimes diarrhea, fulness in the lower abdomen, and sometimes pain in either of the four quadrants. The examination will show ptosis with a low or absence of hydrochloric acid. The relief afforded many of these patients by a properly fitting abdominal support and the administration of hydrochloric acid is dramatic.

Chronic colitis is a cause of obscure abdominal pains in many patients. There are several features which tend to characterize the pain, namely, a tendency to localize at times in any one of the four abdominal quadrants, but at other times to shift from one quadrant to another; its tendency to be aggravated by coarse foods, fruits and constipation; and its tendency to occur in transient cramp-like paroxysms. Nervous symptoms, neurasthenia, headache, neuralgia and tachycardia are prominent. The X-ray will give valuable assistance in clarifying the diagnosis.

Plumbism may cause severe attacks of cramp-like pain in the epigastric or umbilical regions. In acute plumbism there are paroxysmal pains, nausea, vomiting, thirst, diarrhea or constipation, peripheral or optic neuritis and prostration. In chronic lead poisoning the symptoms make their appearance more slowly. There may be a period of obscure symptoms, which include digestive disturbances, foul breath and constipation. These become more severe, and when associated with mild or agonizing abdominal pain, headaches, general lassitude, neuritis, pallor, basophilic degeneration of the red blood cells with anemia, are strongly suggestive of lead poisoning. The history of exposure to lead, and the presence of the "lead line" on the gums makes the diagnosis certain.

Intestinal parasites may cause colicky pains simulating appendicitis in young persons. An increased appetite, pallor, under-nutrition, irritability, malaise, and nervous symptoms of varying degrees may be given in the history. A diminished number of erythrocytes, and aneosinophilia should suggest parasitic infestitation. Finding ova in the stools will definitely clinch the diagnosis.

Primary carcinoma and sarcoma of the liver are rare. The pain as a rule is severe, more so than in secondary carcinoma and may be felt in the upper right quadrant and in the back. During the early stages of pain there is confusion with a gall-bladder condition, but a gall-bladder history may be lacking, the liver enlarged and irregular, and the course rapidly downward.

Influenza with severe abdominal pain as the predominating symptom occurs in a few cases. The pain may be localized in either of the quadrants, but more often is perceived on the right side where it is confused with

XUM

acute appendicitis or cholecystitis. The sudden onset, prostration, high pulse rate as well as temperature and sweating would point toward influenza. The diagnosis of influenza abdominalis is a precarious one, but it is easier to make in times of an epidemic. Even then the diagnosis can only be made by exclusion. One must bear in mind particularly that an apparent attack of influenza may intensify a chronic process in the appendix or gall-bladder which may eventuate in an acute surgical lesion.

The presence of abdominal pains in neurasthenics should always be a subject of considerable investigation before a definite diagnosis is made. The neurasthenic is frequently subject to the delusion that there is something radically wrong in the abdomen and even though removal of an ovary or the appendix may relieve the symptoms for a time the pain soon returns, or is found in a new location, so that it is almost impossible to relieve this class of people with or without an operation.

After a review of the non-surgical conditions that may cause pain in the abdomen it may be well to consider some general points which often serve as important leads in our deductions. The time of life in which the pains more commonly occur is a valuable guide as to the probable cause. Cardiac lesions of which coronary thrombosis is the most outstanding, causing pain in the epigastrium, is more likely to occur in elderly persons, while cholecystitis is found more frequently in persons less advanced in years. Acute pancreatic disease may occur in persons of middle age or just beyond, and perforated gastric or duodenal ulcer tends to occur more frequently in young and middle aged people. Primary hepatic carcinoma is more likely to occur in persons in the cancer age, though we have seen it occur in a girl of twenty years. Neurosyphilis usually develops years after the initial lesion, hence we expect to find it more often after the fortieth year. Lesions in the thorax with symptoms simulating abdominal pathology are met more frequently in children and young adults, though they may be met in middle aged individuals. Intestinal parasites are more common in children and young adults. Herpes zoster and intercostal neuralgia may occur at any age, while influenza abdominalis probably attacks more frequently individuals before the forty-fifth year. Colitis is more frequent in the middle aged. Plumbism is usually an occupational disease.

A detailed history is essential, and except in the gravest emergency it should not be hurried over. A careful inquiry might bring to light the history in early years of an infection notorious for producing changes in the heart, blood vessels and kidneys, an important point to bear in mind when dealing with a case of suspected coronary thrombosis. Many times the history will reveal certain symptoms which will direct the attention of the clinician to the cardio-respiratory, gastro-intestinal and nervous systems. The clinician who properly evaluates symptoms may see in them evidences of disease which may be the cause of the patient's complaint. The type of pain, its manner of onset, its location and duration, and the associated symptoms must be carefully analyzed.

The physical examination should be equally searching. The four cardinal methods of examination should be employed freely and in a deliberate manner. The chest should be examined with the same special care that is devoted to the abdomen. When the symptoms are vague and the need for haste is not urgent, repeated and additional examinations, including laboratory examinations, should be made at short intervals. The facts derived from the history, physical findings and laboratory examinations are studied by the clinician and his interpretation of these facts is the working diagnosis.

Conclusions

The correct diagnosis of the cause of abdominal pain is dependent upon the thoroughness of the study of the case. The differential diagnosis must not only include the surgical possibilities within the abdomen, but also non-surgical conditions both within and without the abdomen that may give similar manifestations. A thorough analysis and correlation of all the facts obtainable from a careful history, a diligent physical examination, supplemented by such laboratory tests as are necessary, and close observation of the patient, will aid in arriving more quickly at a diagnosis in the majority of cases.

CHEER UP!

Grim trouble lasteth but a day,
Cheer up, cheer up, ye blue ones!
Your sorrows soon will pass away—
And then you'll have some new ones!

—The Date Palm.

XUM

PLASTIC AND RECONSTRUCTIVE SURGERY OF THE FACE AND JAWS.*

By ROBERT H. IVY, M. D., D. D. S., F. A. C. S.,
Philadelphia, Pa.
Professor of Maxillo-Facial Surgery, Graduate School of Medicine, University of Pennsylvania.

Defects and deformities of the face and jaws may be congenital, they may be due to trauma, to disease, or to the destruction of tissue incident to the treatment of disease.

When a case of this character presents itself, careful attention must be given to the following points:

(1). It is important to know whether the original disease causing the condition still exists. If a saddle nose deformity be due to syphilis, for example, it is obviously unwise to attempt correction while the syphilis is still active.

(2). Presence of infection. Infection in soft tissues or bone renders them unsuitable for plastic operations. Before attempting reconstruction, all possible sources of infection must be eradicated.

(3). Before the secondary correction of deformities after injury, sufficient time must be allowed to elapse for the thorough seasoning of scar tissue. The time required may be set at four to six months after the injury.

(4). The general physical condition must be taken into consideration. Persons suffering from diabetes, secondary anemia, cardiac, renal or pulmonary disease offer obstacles to the best results, and the plan of procedure must be modified accordingly.

(5). The age of the patient may influence the procedure to be adopted. It is obviously unwise to subject a patient of advanced years to extensive reconstructive procedures requiring several operations. On the other hand, in children certain congenital deformities are best postponed until full growth has been attained.

(6). The social status, occupation and economic considerations may be important factors in determining the type of reconstructive work.

(7). The mental attitude of the patient should never be overlooked. As Blair so aptly remarks, we must treat what is behind the deformed face as well as the deformity itself. An excellent physical result does not necessarily remove the inferiority complex. On the other hand, a mediocre result from the standpoint of the operator may be entirely satisfactory to the patient. The morale of these patients is frequently at a very low ebb, rendering them entirely unfit to go through with a series of nerve-wracking experiences often of several months' duration. Before accepting the case the surgeon should explain in detail just what has to be done and the possibility of unexpected complications that may arise during treatment to prolong it.

(8). There should be a very careful examination to diagnose the deformity accurately. An apparent extensive loss of tissue may on examination prove to be simply due to displacement, practically all of the tissue being present. If the deformity involves bone, X-ray examination may afford valuable information.

(9). The case should be recorded and studied by means of photographs, measurements, plaster of Paris casts, etc. These records are of value in comparing results after operation with the original condition, and also afford a means of planning out the procedures to be followed. Comparative photographs before, during and after treatment should be made as nearly as possible under the same conditions, such as position, size, length of exposure, etc. The keeping of careful illustrative records entails almost as much work as the actual treatment of the case.

Sources of Tissue Used in Reconstruction About the Face and Jaws

In the correction of a deformity of the soft tissues of the face, the first procedure is to excise the scar tissue, thus allowing as far as possible the replacement of the parts in their normal positions. When this is done, the amount of tissue needed to fill the defect can be readily determined. In the simplest case with very little tissue loss, the introduction of new tissue into the defect may be quite unnecessary. Here, the skin edges are simply undermined so that they can be brought together and sutured without tension. When there has been a noticeable amount of hard or soft tissue loss at the site of the scar, new tissue must be brought in to replace that which has been lost. New tissue is supplied in two forms: by flaps, and by grafts.

By a *flap* is meant a piece of tissue, used to cover or fill a defect, which has been detached from its underlying support, but which still

*Represented at the Clinic of the Gill Memorial Eye, Ear and Throat Hospital, Roanoke, Va., March 21, 1928.

remains partially connected with its original site, and receives nourishment from this attachment until healing has occurred in the new position.

By a *graft* is meant a piece of tissue completely detached from its original position and transferred to fill or cover a defect in an adjacent or distant part of the body.

Flaps

The principal forms of flaps employed about the face and underlying structures may be tabulated as follows:

1. Sliding flaps (French method).
2. Pedicle flaps (Indian method).
   (a) Direct transfer.
   (b) Delayed transfer.
   (c) Tubing of pedicle.
   (d) Double pedicle.
3. Flaps by regional juxtaposition (Italian method).
4. Flaps by successive migrations (jump flaps).

Sliding flaps. This is generally called the French method, although probably originated by Celsus in the first century A. D. A sliding flap is drawn into the defect from the immediate locality after extending incisions in various directions from the original wound and undermining the skin. About the face the use of sliding flaps is limited to defects of minor degrees. When employed for large defects, undue distortion of normal tissues is likely to result.

The sliding flap principle can be applied to subcutaneous fat as well as to skin. For instance, in correction of a scar with a moderate amount of depression after excising the scar and loosening the skin edges, the subcutaneous fat on each side can be undermined for a certain distance so that some of this can be drawn into the centre of the wound to obliterate the depression. The operation is completed by suturing the skin edges.

Pedicle flaps. Where the defect is so great that tissues immediately adjacent to the wound are not available, a skin flap must be raised at some more distant point, carried over and sutured into the defect, but left attached by a pedicle to its original site for nourishment until establishment of circulation between the flap and its new surroundings, after which the pedicle may be severed and returned if desired to its original bed. This is the method of choice for restoring defects of the face, since it furnishes new tissue of good blood supply, and with a minimum amount of distortion of normal structures.

In transferring large pedicle skin flaps from a distance, due attention must be given to the insuring of a proper blood supply through the pedicle. Wherever possible, it is advisable to plan the flap so that it runs in the general direction of the arterial blood supply. Special efforts have been directed during recent years to the development of procedures which will permit the use of longer and larger flaps from a greater distance, thus avoiding further disfigurement of visible parts of the body and permitting the surgical correction of greater defects than was heretofore possible. Of these methods, the most important are: delayed tranfer of the flap; tubing the pedicle; and the use of a double pedicled flap.

The *delayed transfer* method, advocated by Blair,[1] consists in first completely raising the flap and then immediately suturing it back into its orginal bed, the transfer to the new position being delayed for a period varying from six days to two weeks. This permits the use of a longer, narrower and thinner flap than by immediate transfer. If the flap will not survive, it is an advantage to have this fact demonstrated before transfer rather than after placing it in its new position.

The *tubed pedicle* method consists in preparing the pedicle by making two parallel incisions from two to three inches apart, raising the skin between them, closing the defect by bringing its edges together after undermining, and then suturing together the parallel edges of the pedicle so that the latter takes the form of a tube or cylinder with skin surface outward. By this procedure the flap gradually gains its main blood supply through the pedicle and a much larger flap from a greater distance can be utilized. As there is practically no raw granulating surface exposed, the wound as a rule remains much cleaner than where the ordinary flat pedicle is employed. After ten days to three weeks, a flap continuous with the distal end of the pedicle can be raised and transferred to fill the defect. At a third operation two to four weeks later, the pedicle is severed, and either unrolled and returned to its original site or utilized for further repair, or it may be discarded. This procedure was worked out independently by Filatoff[2] and Gillies,[3] though to Gillies certainly

XUM

belong the credit for introducing it to general use.

The *double pedicled* flap method consists in raising a flap attached by a pedicle from each side of the median line and sliding it up or down to the part to be supplied with new tissue. A flap can be slid up from the chest or neck in this manner to restore the chin or lips. A double pedicled flap from across the scalp, attached to the temporal region at each end, can be brought down like the chin strap of a hat, to restore the lower lip and the chin, in the male, the hair on the flap being advantageous in forming a beard and concealing the scars.

Flaps by regional juxtaposition, or Italian method. This is the use of a pedicled skin flap raised from the arm or leg to repair a defect of another part of the body, the two parts being held in juxtaposition by artificial fixation during the time required for healing. From a practical standpoint the skin of the arm just above the elbow is most available for facial defects. A suitably sized and shaped flap is raised from the anterior surface of the arm and sutured into the facial defect. The parts are held together by fixing the hand and forearm over the top of the head with plaster of Paris dressings for about two weeks. After this time, the arm pedicle can be severed, the plaster fixation removed and the flap trimmed and suitably adjusted in its new position. The advantages of this method are that an abundant supply of tissue can be had without additional scars about the face. It has great disadvantages, however, viz., the difficulty in keeping the parts clean and avoiding infection, dissimilarity of texture of skin of arm and face, and above all, the extreme discomfort suffered by the patient. In view of these considerations, and the usual availability of other more suitable tissues, the Italian method should be used only as a last resort. A modification employed frequently by Ferris Smith, which does away with some of the disadvantages has a certain field of usefulness. This consists in preparing a tubed pedicle on the anterior surface of the arm from the shoulder toward the elbow, carrying a flap formed at the lower end of the tube up to the face, with fixation of the arm in the Velpeau position, the head being held with plaster of Paris, inclined toward the shoulder. This position is much more comfortable for the patient than the original Italian position and the parts are more easily kept clean.

Flaps by successive migrations. A flap is raised at some distant part of the body and by successive transplantations of first one end and then the other is gradually made to approach its final site on the face. Or, a flap from the abdomen or buttock may be grafted on the hand and by this means be transported to the face. This method is very seldom employed, but its possibilities should not be overlooked in cases where other means of supplying tissue may not be available.

The principal sources of pedicle flaps for supplying defects of the face may be summed up as follows:

(1). *Forehead.* Delayed transfer. Especially for nose.
  (a) Supraorbital and angular pedicle.
  (b) Temporal pedicle.

(2). *Scalp.* Double pedicle for defects of chin and lips. Delayed transfer.

(3). *Neck.* For small defects of cheek, lips, etc. Delayed transfer or tubed pedicle. Has the disadvantage that it makes additional visible scars.

(4) *Chest.* Tubed pedicle. For large defects of face.

(5). *Back.* Tubed pedicle. For large defects of face.

(6). *Arms.* Tubed pedicle from anterior surface of arm. Plaster fixation in Velpeau position. For large defects of face.

Grafts

Grafts, or free tissue transplants, are employed for covering or filling defects either in conjunction with flaps or independently of them. It has been well established to our satisfaction that only auto-grafts, *i. e.*, transplants taken from the same individual, will give satisfactory results.

The principal tissues used as free transplants in the facial region, and their sources, are as follows:

1. Skin.
  (a) Epidermic (Ollier-Thiersch). From anterior surface of thigh, or arm.
  (b) Full-thickness (Wolfe-Krause). From abdomen.
2. Fat and fascia lata of thigh.

3. Cartilage.
   (a) Ear.
   (b) Costal.
4. Bone.
   (a) Crest of ilium.
   (b) Osteo-periosteal from tibia.

1. *Skin grafts.* (a) The *epidermic* (Ollier-Thiersch) graft is employed for covering superficial raw external surfaces, and for replacing lost mucous membrane of the mouth, nose, etc. This form of skin graft has the advantage that it usually takes readily, even in the presence of some infection, and in the oral cavity, but undergoes considerable shrinkage and does not give such a soft pliable surface after transplantation as the full-thickness graft. The best support for the graft is a piece of dental impression compound, as suggested by Esser. This is softened in hot water and moulded to the raw surface to be covered, thus giving an exact imprint of the skin defect. The piece of compound is now chilled with cold water. The skin graft, raw surface out, it spread upon the compound without wrinkling, and by this means is applied to the defect. The compound is fixed firmly in place with adhesive plaster and a bandage. The dressing should not be disturbed for seven to ten days. Upon removal of the compound mould, the skin graft should be found firmly adherent to the raw surface of the defect.

Replacement of lost mucous membrane. Free epidermic grafts can be used in the mouth and nose to replace lost mucous membrane. This method is useful where, as a result of ulceration, from traumatism or disease, adhesions take place between the lips or cheeks and the gum covering the alveolar process, interfering with opening of the mouth, embarrassing speech, or preventing the insertion of artificial dentures. The development of this procedure by Esser and others has been well described by Dorrance.[4] After dissection of the adhesions and scar tissue, the graft on dental impression compound is held in place against the raw surface by means of a splint attached to the teeth. The Thiersch grafts when first introduced into the mouth are pale in color, but after several months come to resemble normal mucous membrane. The use of the Ollier-Thiersch skin graft for lining the maxillary sinus after removal of its mucous membrane in radical operations has been advocated by Sheehan[5] and Ferris Smith.[6] The graft is held in firm contact with the bony wall of the sinus by means of a small rubber balloon, which after insertion is inflated, its nozzle protruding from the nostril.

(b) The *full-thickness* skin graft can be used for supplying losses of skin of varying extent, and is also advocated by some surgeons for furnishing lining for the mouth and nose. It makes a more pliable and natural-appearing replacement than the epidermic graft, does not undergo so much shrinkage, and can be used for larger defects. The full-thickness graft does not take so readily as the epidermic graft. It is not adapted to covering granulating surfaces. It should only be used on a fresh wound or on one made by excision of scar tissue. Each part of the full-thickness graft depends for its nourishment upon the tissue immediately beneath it; therefore, there is theoretically no limit to its size. Receipt of nourishment is favored by cutting the graft to the exact size of or slightly smaller than the defect, suturing its edges exactly to the edges of the defect under slight tension, so that its vascular spaces will be held open, and keep every part of it closely in contact with the raw surface beneath by a pressure dressing. A tin-foil pattern is first made of the raw surface to be covered. This pattern is applied to a suitable area of the abdominal wall and the portion of skin to be removed is accurately traced with the knife. The graft should include the full thickness of the skin, but should not take any of the subcutaneous fat. It is transferred to the raw surface to be covered, and accurately fastened in place with interrupted dermal or horsehair sutures. The graft is covered with several layers of gauze impregnated with 3 per cent xeroform ointment, and the desired pressure is furnished by application over this of a large soft sea sponge compressed slightly with adhesive strips and a bandage. The proper amount of pressure is gauged by experience. Too much pressure will result in necrosis, and too little pressure will cause accumulation of blood and serum under the graft. The pressure dressing should not be removed for at least four days, and if it becomes necessary to change the gauze, the pressure should be reapplied and kept up for at least ten days. For further technical details the reader is referred to the article by Blair,[7] Ferris Smith,[8] instead of sponge, uses

XUM

for pressure a rubber bag inflated with air. He has found by actual measurement with the sphygmomanometer that the optimum pressure is about 30 mm. of mercury.

2. *Fat and fascia grafts.* These tissue transplants are used about the face to build out depressions due to loss of soft tissue from various causes. Subcutaneous fat from the abdomen or gluteal region has been employed, but it has been found that a good deal of absorption takes place after transplantation. *Fascia lata*, with or without overlying fat, has been found to give much more permanent results.

3. *Cartilage.* Cartilage is employed for building out defects of hard tissues, such as bone and cartilage. It is not to be used for restoration of continuity of movable bones, such as the mandible, but simply to add prominence to parts like the bridge of the nose or the chin. Transplanted cartilage does not unite with bone, but becomes connected with it by dense fibrous tissue.

(a) *Ear cartilage.* The yellow elastic cartilage found in the external ear may sometimes be used advantageously for rectifying very small defects, such as in the ala or the bridge of the nose. This type of cartilage after transplantation undergoes absorption and replacement by fibrous tissue, so that it is not adapted for large defects. A suitable piece of this cartilage can be removed under local anesthesia through a small incision over the tragus or on the posterior surface of the concha, leaving an unnoticeable scar.

(b) *Costal cartilage.* There has been much discussion regarding the best material for building out defects of the supporting structures of the face. At one time paraffin was extensively used, but it should have no place in reconstructive surgery of the face, as it is difficult to control in injection, causing unsightly disfigurements, undergoes change in shape, and has caused embolism and tumor formation. Celluloid, ivory and other foreign substances have their advocates, particularly in Germany, Austria and New York. They have the advantage that they are easily inserted without mutilating other parts of the body, but are subject to all the disadvantages of any foreign body, and extrusion is possible at any time. Transplanted bone as a support for the bridge of the nose is employed by some surgeons. It is a well-known fact that a bone graft embedded in soft tissues will usually undergo absorption in time, and for permanency it must be in contact with good bone at each end. This obviously renders it unsuitable as a nasal support in most cases. Also, the slightest infection will lead to loss of the bone graft. Costal cartilage is by far the most suitable of all substances to build out defects of supporting structures of the face, especially the bridge of the nose. It is not difficult to obtain in any quantity desired, is easily trimmed to suitable size and shape, and rarely undergoes absorption when embedded in soft tissues. The cartilage transplant is not necessarily lost if suppuration occurs. In the removal of costal cartilage a longitudinal incision three inches in length is made three inches to the right or left of the median line, the lower part of the incision extending over the costal margin. The fibres of the rectus abdominis muscle are separated, bringing into view the lower costal cartilages. These being below the attachment of the pleura, there is no danger in their removal of opening into the pleural cavity with production of pneumothorax. A piece of the full thickness of the eighth or ninth cartilage, as long as necessary, including the perichondrium, is removed. The chest wound is closed with buried catgut and superficial silkworm gut sutures. The cartilage is then trimmed to proper size and shape to fill the fascial defect. As much as possible of the perichondrium is preserved. During the trimming the cartilage is held in Allis forceps and not touched with the hands. The technique of inserting the cartilage into its new position varies with the defect to be filled. Any considerable portion of cartilage left over can be inserted beneath the skin through the chest incision, whence it can be easily removed under local anesthesia at a later date if needed for further reconstruction.

4. *Bone.* Bone transplantation to the facial region has its chief indication in losses of continuity of the mandible. but is also used for cranial defects and for building out the contour of other bones. In the mandible, bone grafting is useful for restoring continuity after fractures with non-union, and also for supplying bone lost as a result of necrosis or neoplasm.

Methods of Bone Grafting in the Mandible, and Other Facial Bones

For restoring the lost bone substance, sev-

eral methods have been used, according to the preference of the individual operator and the requirements of the given case. Aside from the particular source of the graft, success depends upon certain underlying principles, among which are, waiting for elimination of all sepsis in the field of operation, proper preliminary fixation of fragments in case of fracture, by interdental splints, the employment of rigid aseptic technique, and the avoidance of opening into the buccal cavity at operation.

After thorough trial of several methods and sources of bone graft for the mandible, we have found two to be superior to all others, each having its own indications:

1. *Osteo-periosteal graft of Delagénière.* This consists in the removal of a thin strip of cortical layer of bone from the antero-internal surface of the tibia with overlying periosteum attached and laying two or three pieces of this between the mandibular fragments after preparation of subperiosteal pockets and freshening of the bone ends. The osteo-periosteal graft contains all of the elements necessary for osteogensis, is flexible, and is easily adjustable to the size and shape of the defect. The technique of removal (shaving off with a broad chisel) and insertion is simpler than that of any of the other methods. It causes no disability in the leg. It generally requires longer to obtain consolidation than by other methods, and no dependence, of course, can be placed on the rigidity of the graft itself for fixation. While this form of graft can be used for losses of substance of almost any extent and any position, we reserve it for defects of 2 cm. or less, and in cases where the external contour of the face shows little or no deficiency on account of the bone loss.

2. *Graft from the crest of the ilium.* An incision is made along the crest of the ilium down to the periosteum, beginning at the anterior superior spine, back as far as necessary. The muscles attached to the inner and outer sides of the crest are stripped down and a piece of bone is removed with a metacarpal saw comprising the full thickness of the crest of the ilium and of sufficient length and depth to fill the gap in the mandible, allowance being made for overlapping the mandibular fragments at each end. The graft is fixed in position by fine brass wire passed through holes drilled in the bone.

The crest of the ilium furnishes a large, thick piece of bone, of porous structure closely allied to that of the mandible, and is easily penetrated by new vascular supply. It can be used for losses of substance of almost any size, and can be readily cut to suitable shape. Its bulk adapts it to filling defects which cause considerable visible deformity. The disability produced by removal of the graft is quite temporary, and the danger negligible. Union should occur in about twelve weeks. For more complete details of bone grafting, the reader is referred to the article by Ivy and Epes.[9]

Restoration of full-thickness defects of cheeks, lips, nose, etc. One of the most important principles to be recognized in the repair of facial deformities is that, in defects involving the full thickness of the lip, cheek, nose, etc., it is necessary to replace the lost mucous lining as well as the skin covering. If such a defect be simply covered with a single flap with raw surface exposed inside, unsightly contraction will occur, and healing of the edges may not take place.

The chief ways of carrying out the above mentioned principle may be summarized as follows:

1. Folding over the distal end of a pedicled flap so that it will have skin on both sides.

2. Hinge flap, inverting skin from edge of defect, and covering raw surface with separate pedicled flap.

3. Separate pedicled flaps of skin for lining and covering.

4. Pedicled or sliding flaps of neighboring mucous membrane, combined with skin flaps for covering.

5. Thiersch or Wolfe graft applied to under surface of pedicled covering flap, before transfer.

Removal of hair. It is sometimes necessary to use flaps of hair-bearing skin in restoring defects of parts where it is undesirable for hair to be present, such as the nose, or inside the mouth. Various suggestions have been made for destroying the hair follicles. One is exposure to radiation, either before or after transfer of the flap to its new position. However, it is very difficult to produce permanent destruction of hair follicles with X-ray dosage that will be harmless to other tissues of the skin. Electrolytic depilation is more certain, and is useful for removing a few scattered hairs, but is very laborious and almost impracticable where the growth of hair is

XUM

abundant. A more practical method is that advocated by Rethi.[10] After the hair-bearing skin flap has been raised, with a razor or sharp scalpel the layer containing the hair follicles is trimmed off from its under surface. By delaying transfer of the flap for ten days, this thinning process is not so likely to interfere with nutrition.

(The principles outlined in the above were applied to cases illustrated by lantern slides.)

REFERENCES.

1. Blair, V. P.: *Surg., Gynec. and Obst.*, 33:261, 1921.
2. Filatoff, W.: *Presse méd.*, 31:1061, 1923.
3. Gillies, H. D.: Plastic Surgery of the Face. London, 1920.
4. Dorrance, G. M.: *Ann Surg.* 71:360, 1920.
5. Sheehan, J. E.: *Surg., Gynec. and Obst.* 35: 358, 1922.
6. Smith, Ferris: *J. A. M. A.* 75:1554, 1920.
7. Blair, V. P.: *Ann. Surg.* 80:298, 1924.
8. Smith, Ferris: *Surg., Gynec. and Obst.* 43:99, 1926.
9. Ivy, R. H., and Epes, B. M.: *Mil. Surgeon.* 60: 286, 1927.
10. Rethi, A.: *Zentralbl. f. Chir.* 50:1393, 1923.

Medical Arts Building.

THE CLINICAL ASSOCIATIONS OF ASCITES.*

By LESLIE T. GAGER, M. D., Washington, D. C.
From the Department of Medicine, George Washington University School of Medicine.

Speaking of the narrowing influence of concentration in a single field of medicine, Osler once said that the corrective of this fatal tendency of specialization lies in the fact that in all branches of practice "problems in physiology and pathology touch at every point the commonest affections, and exercised in these, if only in the earlier years of professional life, a man is chastened, so to speak, and can escape the deadening effect of routine". The words of the master have lost none of their force. While it is true that in the evolution of medicine, looked at in the far perspective of history, Harvey and Hunter, Vesalius and Virchow, Paré and Lister are contemporaries all, a glance shows that no generation of men has made more progress than the present in the study of bodily function.

For example, Withering, you may remember, had the scantiest conception of the real mode of action possessed by the foxglove that he had recognized as the essential drug in the Shropshire herb woman's mysterious formula, and it was not until a century had passed, and men like Cushny and Mackenzie had arrived, by means of the precision of graphic methods, at some understanding of the physiology of the heart beat, that digitalis could be used in a rational way. How much less effective would be our knowledge of diabetes mellitus, and the use of insulin, if, indeed, this could have been perfected, without an easy method at our disposal of determining the blood sugar? If Richard Bright or William Stokes or Ludwig Traube could return today to clinical medicine, surely their practice would still be on a high level, but just as certainly, I believe, would they be severely handicapped until they had learned to use the blood count, the sphygmomanometer, the bacteriological and serological supports of modern diagnosis, and a score of other methods by means of which we investigate disorders of structure and function that often are not accessible, early enough or definitely enough, or at all, to eye, hand or ear.

Factors in Water Balance

And one of these expanding chapters in practical physiology and therapeutics has to do with the fate of water in the body, its normal use and elimination, or the forms taken by its pathological retention. The problems of edema, and among other forms its exhibition as ascites, go deeper often than the mere mechanical obstruction to the flow of blood or lymph, and are to be understood, and successfully treated, only in terms of tissue metabolism, of the varying amounts of sodium, potassium, calcium and their salts which are present, of protein starvation, of thyroid insufficiency—in a word, all factors which play a part in water balance.

Among many remarkable things in metabolism, not the least notable is the exactness with which the weight of the body is maintained over many years at an almost constant level. This means, as Dubois has pointed out, that automatically—unless in our high state of civilization, the mechanisms of nature are overruled—the intake of food and drink and the expenditure of energy must have been mutually adjusted over all this long period within an error of a few hundredths of one per cent. And of the physiological processes to which this state of equilibrium is

*Presented, by invitation, to the Montgomery County (Md.) Medical Society, December 18, 1928.

due, the importance of water metabolism is soon made clear when its regulation is upset by disease.

In a dry world, life cannot persist. Water is essential to all those chemical reactions, physical changes, energy transformations, which lie at the bottom of cellular activity. Water is a vehicle for the transport of nutriment and of heat; it lubricates the internal surfaces of the body; loosely combined, or taking the most intimate part in the tissue structure, it forms from 60 to 70 per cent of the normal body weight.

In considering, therefore, the ebb and flow of the water level of the body, it will be worth while to glance at the sources of its water supply, and its means of disposal. Ordinarily in health our daily intake of liquid is 1,500 c.c. or six to eight glasses of water or its equivalent. Rabbits and guinea pigs, it is said, can live for years without drinking water, but in the physiology of human nutrition, and in therapeutics more often than is realized, if water is not consumed as such or in other liquids, it must be obtained in other ways, or the economy suffers. Inanition fever in infants and the state of a patient with diabetes insipidus uncontrolled by pituitrin are examples of water deprivation.

On the other hand, water makes up so large a part of the so-called solid foods, that a patient's diet, quite apart from its liquids, may readily contain from 1,200 to 1,500 c.c. of water a day, a fact of much importance when we come to treat a person with some form of water retention.

Practical Quantitative Methods

It is clear, then, that on an ordinary well balanced diet, the intake of fluid from all sources will approximate 2,500 to 3,000 c.c., of which only about half, or 1,500 c.c, will be excreted by the kidney. Consequently, when a nurse records the volume of urine as the total output of fluid for twenty-four hours, she has not accounted for the water vaporized by the lungs and skin—what the ancients called the "insensible perspiration"—nor that excreted in the feces, and, under some conditions, such as bronchiectasis, in the sputum. Nevertheless, a change in the ordinary ratio of fluid intake to urine output does have a definite clinical significance, and centuries of observation since have borne out the prognostic saying of Celsus that "if more fluid is excreted than is taken, so at length there is hope of health".

Variations in the water balance are more accurately and practically studied, in my opinion, by measuring changes in body weight, a method which began with the famous steelyard of Sanctorius, and with which he carried out weighings on himself over a period of thirty years. After all, as Benedict and Root have recently demonstrated once more, accurate use of scales is a first rate means of studying metabolism.

Differentiation and Classification of Ascites

Accumulations of free liquid in the serous cavities must have been an early observation: the Hippocratic succussion splash—obtained by shaking the patient when air and fluid are in contact, is internal evidence of its antiquity. Though he admitted that his distinctions were of little practical use, Sauvages, in the 18th century, had arrived at the tabulation of twenty-nine varieties of ascites. William Cullen, of Edinburgh, simplified this list into two groups—one with swelling of the whole abdomen and evident fluctuation; the other, sacculated enlargement. The latter form appears to have included ovarian cyst and localized inflammations; the former group, ascites due to visceral obstruction, debility and tenuity of the blood, with further distinctions as to the character of the fluid, whether clear, chylous, purulent, urinous, and oily. Our present classification is but little removed: we endeavor to exclude the cysts of ovary, pancreas, and hydatids, and we attempt to delimit the non-inflammatory hydroperitoneum from the exudation arising in such chronic processes as tuberculous peritonitis and cancer of the peritoneum. Acute peritonitis, I assume, can usually be differentiated readily and treated surgically. Regarding ascites, it will be of interest, I hope, to present brief clinical notes on some of the typical problems in diagnosis and treatment which have been met with recently in hospital and private practice.

Portal Stasis in Hepatic Cirrhosis

When I find a patient with abdominal distention, there flashes across my mind a little nugget of clinical gold—one of my few clear memories of an excellent course in obstetrics—

XUM

which consists in a warning to keep in mind the five "f's": fat, feces, fluid, flatus and foetus. Of course, the differentiation is usually easily made, but my recollection of this aphorism was refreshed by an experience with an old lady nearing 70. As a girl of 17, she had been married off to a man much her senior and of dissipated habits, and it resulted that for several years her intake of alcohol was rather large and constant. When this husband died, she married again, and the rest of her life was abstemious. Nevertheless, at 67 her abdomen began to swell, and the condition seemed clearly one of portal cirrhosis, and the only factor at all definite was the history of alcoholism in her early life.

Except for the exhaustion which was the natural result of carrying her enormous burden, for she was a short thin woman, and the abdominal protrusion was most striking, her physical condition was good. After paracentesis, 16 liters of transudate being removed, her life was happy and comfortable for six months. Then another large amount was tapped, and when, several months later, she again presented herself with distinct swelling of the abdomen, a third tapping was arranged for. Much to my surprise and chagrin, an attempt to obtain free fluid with the trocar, first in one side and then the other, was attended by failure. Though there was moderate dullness in the flanks, I was able to withdraw only a few ounces of liquid, and since nothing in the history or findings suggested inflammation and encapsulation, I was forced to conclude that I had been deceived by the marked distention of a relaxed abdominal wall by intestinal inflation. Waiting before the next occasion until the fluid wave was obtained, dullness being present high in the flanks, the ascitic yield was excellent. With tappings at intervals, this patient went comfortably for about three years. She died while I was out of the city and a necropsy was not obtained.

Ovarian Cyst

The next patient presented a different problem. She was a white woman, 84 years of age, who was seen with Dr. W. E. Whitson, the history being of an onset two years previously with pain in the left flank, gradual swelling of feet and legs along with enlargement of the abdomen. Difficulty in breathing had followed, and there were spells of suffocation.

Her old family physician had treated her for "kidney trouble", and when he died, and Dr. Whitson was called in, all the members of the household, except the patient, were rather indignant when told that something could be done for her.

The examination in the hospital, after a day in bed, showed no edema of the ankles and no pulmonary congestion. The heart was somewhat displaced but not definitely enlarged, though the blood pressure was 180/100. Instead of the bulging in the flanks characteristic of free fluid, the large abdominal tumor maintained its symmetrical up-standing contour, and the diagnosis of ovarian cyst was made. By paracentesis several gallons of dark green fluid were obtained, and two weeks later Dr. C. S. White removed a multilocular cyst, the size of a football, attached by a small pedicle to the left ovary.

This fall, the patient, very much alive, was on her way to Florida by automobile.

Splenic Anemia

The presence of ascites may be a finding which assures a diagnosis, or it may be one of many signs in a complex diagnostic problem.

An Italian male, aged 61, a retired push-cart vendor, had had dull pain in the left side and back intermittently for seven years. Gastrointestinal symptoms had been absent, the urinary tract was normal, venereal disease and malaria were denied.

Physical examination disclosed a man of good nutrition (weight 145 lbs., height 66 inches) and moderate pallor. There were a few carious teeth, the heart and lungs were clear, blood pressure 160/70, pulse rate 60, rhythm regular. There was shifting dulness in the flanks. The liver was easily palpable, firm, and not tender. The spleen was felt as a firm edge, with a notch, three fingers' breadth below the costal margin.

The hemoglobin was 69 per cent, the red blood cells 3,610,000 per cmm., without abnormal forms. The leukocytes numbered 14,400, 89 per cent polymorphonuclears. The Wassermann and Kahn blood tests were negative; the chemical examinations of the blood showed normal blood sugar, nitrogen and bilirubin values.

XUM

The diagnosis of splenic anemia (Banti's disease) was made, and splenectomy was performed. In removing this organ, a short and aberrant splenic artery was torn, and the ensuing hemorrhage brought shock and made necessary a transfusion. The patient did not recover strength and died two weeks later. The spleen showed the fibrotic and proliferative changes characteristic of Banti's form of splenic anemia.

Metastatic Tumors in Liver and Suprarenal Glands

A patient whose diagnostic study was of unusual interest was a white woman, aged 36 years, whose chief complaint was pain of four months duration, in the upper lumbar region on both sides. There was a family history of pulmonary tuberculosis, and in her girlhood, from 13 to 20, when the menstrual periods were irregular, the patient was suspected of being tuberculous.

At the age of 33, a mass was discovered in the right breast, which soon after was amputated.

Urological and gynecological examinations immediately before admission had shown no facts significant enough to explain her symptoms.

The essential physical findings were underweight, weakness, a dark skin, which the patient, a brunette, believed had been increasing in depth of color for several months. There were no areas of pigmentation, nor were the sclerae at this time considered icteric. The blood pressure was 104/64, and a blood sugar estimation had shown a level of 67 mg. There was apical fibrosis, but no rales were heard, the heart was clear, the lever and spleen were not felt. There was tenderness, but no masses, in the kidney regions. The urine was normal; the blood showed a secondary anemia. The impression was recorded of suprarenal insufficiency, due probably to Addison's disease.

A few days later, it was definite that jaundice was present. There was evidence of fluid in the abdomen, and when the report was received of a pathological diagnosis of adenocarcinoma of the breast removed three years before, the diagnosis was made of obstructive jaundice, due probably to a metastasis occluding the hepatic duct. The exploratory laparotomy revealed a liver studded withe metastatic tumors, and at the necropsy four weeks later, the right suprarenal gland also was found largely destroyed by metastasis.

Passing over the effusions which occur in tuberculous peritonitis and in carcinomatosis, both of which usually may be readily recognized by accompanying pathological changes, and the first of which is often, if the tuberculous lesions elsewhere permit, successfully treated by "letting in sunlight", formerly by surgery and now more commonly by heliotherapy, we come to that group of patients with ascites which is the largest and most important of all.

The Ascites of Heart and Kidney Failure

The accumulations of liquid in the peritoneal cavity, either alone or with involvement of the pleural cavity or the pericardial sac, or in the course of anasarca, are the result occasionally of nephritis, more rarely of nephrosis, and commonly of cardiac failure, and give us our best opportunity to apply our fundamental knowledge of circulatory and metabolic therapeutics. The measures to be emphasized are rest, the restriction of fluid intake, a diet low in sodium chloride, and effective use of digitalis. In addition to these, in case of need, we may employ other means of promoting circulation or diuresis, among the latter being the combination, used successfully also in other forms of ascites, of ammonium chloride and novasurol, or merbaphen.

A famous surgeon has said that "the worse the patient, the more you do", and it is often not a bad rule in treating heart disease. The physiological effects of digitalis are sometimes demonstrated to students simply by keeping the patient at rest for a few days. But in the case of C. S., an abese, plethoric man of 50, with an over-burdened, laboring heart, extreme dyspnea, and marked edema and ascites, he was not only put promptly to bed, but started with a two dram dose of the tincture of digitalis and diminishing doses thereafter.

The diet was temporarily restricted to a liter of milk. Diuresis began within twenty-four hours, his dyspnea and ascites vanished, and he left the hospital in ten days a changed man. For two years he maintained compensation, until a relapse occurred in which digitalization was no longer effective. Now theobromine as a diuretic proved of help, while calcium chloride by mouth and novasurol

XUM

hypodermatically in one c.c. doses every two or three days for four doses, was a much more effective combination. The patient improved markedly, was able to go to the country for convalescence, but there was overtaken by another attack of heart failure and died.

Prolonged rest was the important element in the treatment of J. B., an Italian, aged 56, who came into the hospital complaining of weakness and shortness of breath, which had been severe for three weeks, though present at intervals for ten years. The patient was thin, long chested, orthopneic, and strikingly cyanosed. In the lungs there were heard many rales and rhonchi, chiefly during expiration, but there was no evidence of hydrothorax.

The heart was greatly enlarged to right and left, but in spite of a shadow in the X-ray plate which suggested pericardial fluid to Dr. Christie, there was no physical evidence of an effusion. Instead, the apex beat was forceful, and retraction was present at each systole. At times at the apex and in the axilla a grating sound of coarse quality could be heard, and its fremitus felt. There was moderate arteriosclerosis and a blood pressure of 140/80.

The abdomen was distinctly distended with fluid and the liver was enlarged, smooth, and somewhat tender. There was edema of the ankles.

The clinical diagnosis was made of adhesive pericarditis and probably peritoneal serositis as part of the entity long known as Pick's disease.

The patient improve steadily with a rest of six weeks in bed, the edema and the free fluid disappeared, but the cardiac signs were unchanged.

Paracentesis Abdominis

Sometimes in the treatment of ascites following heart failure it seems wise to remove mechanically the embarrassment to the circulation, rather than to attempt to force the liquid through the normal channels of excretion. It is conceivable that the energy is thus saved, the heart might suffice to decide the issue of the difficult situation when cardiac reserve has reached its limit.

Mr. S. is a merchant, aged 37 years, with long standing rheumatic heart disease, who evidently had been experiencing progressive decompensation. During one week he gained ten pounds in weight in the form of edema and ascites. Placed in bed for three weeks on a dry diet, the ascites persisted and the heart rate reached a level never less than 100 beats, even under full doses of digitalis. Finally, after removal by paracentesis of less than 3 liters of liquid, a relatively small amount but all that could be obtained in this patient, there was an excellent circulatory response. The rest of the fluid remaining in tissues and abdomen was quickly eliminated, and the man has been able to manage his business steadily.

The Use of Quinidine in Auricular Fibrillation

An exceptional opportunity to use quinidine came in a waterlogged man of 60 years, whose cardiac decompensation, associated with auricular fibrillation, had not yielded to diet or digitalis. After a preliminary thoracentesis, a course of quinidine was given, but, though an increase in heart rate showed some response to the drug, normal sinus rhythm was not restored. Ten days later, both the hydrothorax, which had reaccumulated, and the fluid in the peritoneum, were drained and the second attempt with quinidine was dramatic in its success. There was prompt diuresis, and the patient, whose life had been despaired of for months, was able to leave his chair and bed and eventually return to business.

Not all of our patients, however, in spite of our best thought and effort, have happy outcomes, and at present we have the problem of a woman of 50 whose shortness of breath, of two years duration, was accompanied by total irregularity of the heart and swelling of the abdomen. There was no liquid to be made out in the pleural cavities and little edema of the ankles. On one occasion, her ascites disappeared after a few doses of novasurol, while on another admission, still later, rest alone was equally successful. Her auricular fibrillation was converted to regular rhythm by quinidine, but the ascites returned. Tapping revealed a fluid with the usual characters of a transudate, though an X-ray plate of the lungs had shown hilus changes considered by the roentgenologist as possibly malignant. Eventually, after much consultation, an exploratory laparotomy was carried out. No evidence of new growth was discovered, and a section of the liver showed an atypical cirrhosis, of the so-called cardiac type, resulting,

it is assumed, from long-standing passive congestion. By a modified Talma operation, an attempt was made to use the omentum, brought forward and placed between the deep and subcutaneous fascia of the abdominal wall, as a new channel for the relief of the ascites. Unfortunately such drainage has not occurred, and it would appear that the patient must submit either to paracentesis at intervals or the more intensive use of ammonium chloride —novasurol diuresis.

Summary and Conclusions

The clinical associations of ascites, it may be said in summary, are of great diversity, frequency, and practical importance.

The commonest cause of ascites is cardiac failure. The dropsy of renal insufficiency, in the course of nephritis or nephrosis, is closely allied. The ascites which is seen in association with pericarditis as a part of multiple serositis, may be placed in this group.

Portal stasis, usually following primary cirrhosis of the liver, produces a classical form of ascites.

Tuberculous peritonitis and carcinomatosis of the peritoneum occupy distinctive places in the differential diagnosis and therapeutics of fluid within the abdomen.

The accumulations of liquid caused by ovarian tumors, solid or cystic, have especial characters and require surgical intervention.

The treatment of ascites begins with a consideration of the underlying pathophysiologic processes, which are not confined to simple mechanical obstruction of blood or lymph flow, but involve cellular metabolic abnormalities.

Therapeutic emphasis is laid on rest, restriction of sodium chloride and fluid intake, and the use of diagitalis. Agents valuable in promoting diuresis include calcium, potassium and ammonium salts, novasurol, thyroid substance where insufficiency of this gland is a factor in edema, perhaps parathyroid hormone to stimulate calcium metabolism, and high protein feeding where large losses of albumin and protein starvation may have taken place. The value of high carbohydrate diets has been suggested both by the course of ascites in experimental hepatic cirrhosis in animals, and by actual clinical results from the use of glucose.* Water itself may be an efficient diuretic.

Paracentesis abdominis may be used routinely (301 tappings in a single patient have been recorded), or in an emergency, or in preparation for other methods of treatment. Ascites, it should be remembered, sometimes represents a crisis of portal obstruction or a passing phase of metabolic disorder. One tapping may give the necessary opportunity for the establishment of collateral circulation or physico-chemical equilibrium, and need never be repeated.

It must be said that in general the operative measures, such as the use of the omentum or of cannulae to provide new collateral channels, have met with failure. In splenic anemia, removal of the spleen has sometimes relieved the ascites.

Our understanding of ascites, then, has been greatly advanced in recent years by physiological methods of study. Much remains to be learned of its fundamental causes, but surely it is one more field of medicine where clinical investigation already is yielding rich results in the knowledge and control of disease.

*In the discussion of this paper, Dr. John T. King, of Baltimore, cited the case of a young man with nephritis whose dropsy, not relieved by any of the usual methods of treatment, cleared up rapidly and completely after being placed on a wholly carbohydrate diet.

References.

Dubois, E. F.: Basal Metabolism in Health and Disease; 2nd Edition. Lea and Febiger. 1928. Esp. Chapter on Water Metabolism.

Keith, Smith and Whelan: The Therapeutic Use of Diets Low in Water and in Mineral Content. *Arch. Int. Med.*, 37:550, 1926.

Benedict and Root: Insensible Perspiration—Its Relation to Human Physiology and Pathology. *Arch. Int. Med.*, 38:1, 1926.

Rowntree, L. G.: Water Metabolism. Physiological Rev. 2:116, 1922.

McCann, W. S.: Diuretic Action of Parathyroid Extract, etc. *J. A. M. A.*, 90:249, 1928.

The Management of Dropsies, *N. Y. State J. M.*, 28:1395, 1928.

Weir, James F.: The Association of Jaundice and Ascites in Diseases of the Liver. *J. A. M. A.*, 91:1888. 1928.

1614 *Rhode Island Avenue, Northwest.*

UNUNITED FRACTURES.*

By R. M. HOOVER, M. D., Roanoke, Va.

Fractures may be either the simplest or the most difficult cases with which a physician has to contend. Most of them are easily reduced and maintained and unite promptly with resumption of function in the usual length of time. The frequency of complications, however, is attested by the fact that there are more damage suits over fractures than any other group of medical cases.

*Read before the Southwestern Virginia Medical Society, at Wytheville, Va., September 27-28, 1928.

XUM

One of the worst complications is non-union. Fortunately, this does not occur very frequently, but we have all seen it many times. Mine and industrial accidents, because of their nature, seem to predispose to non-union.

It is, of course, difficult to say in any individual case just what is the cause of failure of union, but the causes may be grouped under three general heads—mechanical, vascular and constitutional.

The mechanical are the most important factors for us in that they are the basis of most ununited fractures, and are the factors over which we have control. Incomplete reduction with lack of apposition between bone fragments is probably the most important, though in several series of cases which have been reported in the literature, another cause easily took first place. This will be discussed a little later. Wherever there is marked over-riding or wide separation between the bone ends, non-union is not a surprise. The separation is not infrequently due to the interposition of muscle, fascia or other soft tissue between the bone ends, thus preventing contact and union. In these cases, when early, if the bone ends can be brought into contact, union can be expected. Inadequate fixation and immobilization may so disturb the tissue reactions that fibrosis occurs and bone formation is inhibited.

A cause which is partly mechanical and partly circulatory is the early open reduction of the fracture with the use of some non-absorbable metallic device to maintain reduction. Probably the most used are Lane or Sherman plates, bone bands, clamps, screws, nails and wire. It has been conclusively shown by experimental and clinical evidence that bone plates are an important factor in the production of non-union. In two series of cases, referred to above, totalling almost two hundred and fifty, between 60 and 70 per cent had been operated upon before, with few exceptions, for bone plating operations. So that in these cases, this was the most important cause of non-union. We are safe in concluding that early open reduction should only be resorted to in unusual cases, and then bone plates or any other metallic substances never used if reduction can be maintained by any other means. Most of the larger clinics are only using plates where infection is already present. Since the use of skeletal traction has been perfected, a very small per cent of fractures call for an open reduction.

Among the vascular causes of non-union, severe trauma at the time of injury with extensive divitalization of tissue and interference with blood supply is of great importance. Any fracture in which the soft parts are badly devitalized should be handled most carefully to prevent non-union. These cases often become infected and in this way lessen the probability of union.

Among the constitutional conditions which affect bone healing, syphilis is probably the most important. It certainly delays bone growth and sometimes leads to non-union where mechanical conditions are the very best.

There is no sharp line between delayed union and non-union. However, if union is delayed well beyond the usual period, appropriate methods for stimulation of bone growth should be instituted. These include active and passive motion, massage, baking, electrical stimulation, diet and cod liver oil. Function with adequate protection to prevent deformity will produce firm union instead of non-union in many cases.

Where all these measures fail and non-union persists, operation is necessary. There is now a strong consensus of opinion in favor of osteoperiosteal bone graft. Of course, the inlay and massive grafts are used by a few, but osteoperiosteal grafts in conjunction with an intra-medullary peg to maintain reduction seems to be the method of choice. It has been used by my associate and myself with uniform success for the past four years.

To summarize: The causes of non-union are mechanical, circulatory and constitutional. The most important mechanical causes are poor reduction and fixation, and early open reduction with the use of metallic internal fixation. The most important vascular causes are severe trauma and infection. Syphilis is the most important constitutional cause. All conservative methods should be used to promote bone growth, before considering operation. If these fail, operation is necessary. Osteoperiosteal graft with the use of an intra-medullary peg where some means is needed to maintain reduction is then the method of choice and offers good probability of cure.

Shenandoah Life Building.

GAS ON THE STOMACH: A SYMPTOM OF GASTRIC MOTOR DISTURBANCE.*

By WILLIAM J. MALLORY, M. D., Washington, D. C.

This unscientific title represents a complaint so common and annoying that it deserves more serious consideration as a symptom complex than it usually receives.

The patient's complaint is of "gas on the stomach." Inquiry elicits, if not all, many of the following more minute details:

Within fifteen minutes or half an hour after eating there is a feeling of weight, fullness, tightness in the upper abdomen. The stomach feels full before the meal is finished. There is a sense of pressure under the heart; sensations run up into the neck, and palpation and embarrassed respiration frequently occur associated with mixed vaso-motor and nervous symptoms. The symptoms are not definitely dependent upon the kind of food eaten, though some articles of diet are said to disagree. On the contrary, there are occasions, not more than a few days part, when anything can be eaten without discomfort.

Fatigue, bother, worry, confusion and excitement seem to predispose the disturbance. Voluntary belching of gas or sour fluid or the eructation after soda relieve temporarily though not permanently. Digestants, such as hydrocloric acid, pepsin, and most remedies directed to aiding digestion or preventing fermentation, fail to give relief.

These symptoms are usually misinterpreted and the diagnosis, if one is made, is often erroneous. Hyperacidity, gastritis and gastric fermentation are sometimes named, and when the complaint persists, ulcer, chronic appendicitis and gall-bladder disease are added to the diagnosis. Rarely one or more abdominal operations are performed without relief.

This condition is not due to hyperacidity, although the eructation of sour fluid sometimes suggests such a cause. The gastric acidity is found normal or sub-normal after a test meal. The eructation is the abnormal feature, not the gastric secretion.

It is not due to gastric fermentation; first, because the symptoms arise after a time too short (fifteen to thirty minutes) for the formation of such volumes of gas as are brought up; second, gastric contents aspirated and kept in a thermostat twenty-four hours produce little or no gas.

*Read before the George Washington University Medical Society, November 17, 1928.

Gastritis is not the cause. The history symptoms of laboratory findings are not those of gastritis, either acute or chronic. Nor does the treatment for that condition afford relief. The condition occurs without the history clinical symptoms or laboratory findings of ulcer, gall-bladder disease or chronic appendicitis. It is not relieved by surgical operations and does respond to other treatment.

The condition is a motor disturbance and is not due to altered secretion or failure to digest the food.

A right interpretation of these symptoms is based upon an understanding of the normal motor functions of the stomach, and an appreciation of the manner in which this function is altered.

The lumen of the stomach of normal tonus is small and its content of gas or fluid is slight. The organ is contracted. Normally, on the swallowing of food there is a relaxation of the stomach in proportion to the amount ingested until the organ has become distended approximately to its full size. At this stage there is only a moderate gas bubble at the fundus equal to one-fourth of the total gastric contents. Following this by fifteen or twenty minutes, digestion and peristalsis begin and there is co-ordinate gastric peristalsis and pyloric opening with intermittent evacuation, till the stomach is again empty.

Contrasted with this normal performance, when patients presenting the syndrome above described are examined before the fluoroscope, the following condition is found:

The first swallows of the barium mixture seem to sink to the bottom of a long narrow "fish-hooked" or "J"-shaped stomach. On being told to drink the remainder, patients frequently say, "I can't swallow any more." When asked why, they say. "Because my stomach is already full." This is despite the fact that the stomach is not one-quarter full. The small amount of barium mixture is lying at the bottom, the middle portion is stretched out, and the fundus is occupied by a very large gas bubble. On finally swallowing the usual amount of the barium mixture this is seen lying at the lowest portion of the relaxed stomach and occupying scarcely one-half of the lumen, the remainder being filled with gas, —that is, air. The barium mixture, both at the pyloric and fundus portions, shows a horizontal level and peristalsis is slowly ini-

XUM

tiated. Belching sometimes occurs with the beginning of effective peristalsis, with resulting reduction in the relative size of the gas bubble as compared with the filled portion of the stomach.

In the light of the above mentioned clinical symptoms and laboratory findings, the following explanation is given:

At the time of the ingestion of food the atonic stomach relaxes more than is required by the volume of food and the extra space is occupied by air which enters by way of the esophagus. The sense of weight, tightness and fullness coming on so promptly after a small amount of food, is due to a stretched atonic stomach.

With the beginning of peristalsis the sense of tension increases and the cardiac sphincter relaxes, with the eruption of gas, and a resulting sense of relief. Hence the patient's interpretation that gas on the stomach is the cause of all the associated disturbances, and since it occurs soon after eating, food is blamed for the gas and the diet is restricted unreasonably and eructation cultivated.

The cardiac and vasomotor symptoms, such as palpitation, irregularity, flushing and peculiar indescribable sensations in the head, may be either secondary to disturbance of gastric tone, or, more probably, both the gastric motor disturbance and the vasomotor symptoms are due to alterations in vagus and sympathetic co-ordination.

In this, as in any other condition, diagnosis is not only differential diagnosis, but likewise the recognition or exclusion of accompanying pathologic processes, whether related or not related to the major symptoms. Therefore, the diagnosis can only be made after a thorough history, physical examination and laboratory study. The diagnosis may be made when chronic disease of the abdominal organs is excluded and the above mentioned symptoms and findings are present.

The treatment is nearly the opposite of what is commonly employed. The diet should not be the usual soft or liquid diet, such as soup, broth, milk-toast, cereals, mush, and raw eggs.

Hydrochloric acid, pepsin, bismuth, salol, phenol, alkalis, purgatives and enemas are not indicated.

A diet applicable to the condition of the stomach's function is a bland solid diet, as follows:

To be omitted:

Soups and broths, fish and shell-fish, raw fruits, raw vegetables, salads of every kind, veal, fresh pork, sweetbreads, tongue, liver, sausage, meat loaf, croquettes, hash, stews, creamed dishes, and game. No cabbage, corn, tomatoes, peas, beans, sweet potatoes, mushrooms. No melons, berries, preserved fruit, pineapple, cherries, candy or fancy cakes. No olives, pickles, caviar, sardines, cured fish, catsup, or sauces. No aerated or soft drinks, milk or buttermilk, wine or beer, home brew, chocolate or cocoa. No water ices, chocolate or fruit ice cream. Little salt, pepper or condiments.

Allow only:

Tender, rare beefsteak or roast; lamb chop or roast; boiled or baked ham; breakfast bacon; eggs—soft boiled, poached, scambled, or plain omelet.

Vegetables allowed: Beets, salsify, egg plant, carrots, turnips, parsnips, string beans, pumpkin, squash, asparagus tips, beet greens, spinach, kale, mustard tops, cooked water cress, cauliflower, brussels sprouts, white potatoes, mashed or baked; bread: hard, crisp, well baked baker's bread, such as French rolls, Vienna rolls, well baked home-made bread, rolls or muffins; toast zwieback, plain crackers, noodles, macaroni and spaghetti without cheese; rice; well cooked, ground cereals. Butter, salted or unsalted; cottage cheese, vanilla or coffee cream, custards, jellies, cooked fruit, junket, plain puddings, plain cake, i. e., home-made pound cake, cup cake, plain cookies. Coffee, tea, water.

Belladonna is almost a specific. It acts at the neuro-muscular juncture, by abolishing excessive stimuli, reaching the digestive canal from the extrinsic nervous system, and so relaxes spasm and prevents inhibitory influences form outside the intestinal wall interfering within the effective action of the intrinsic neuro-muscular mechanism, the plexus of Auerbach and Meissner. It therefore tends to restore normal peristalsis, and does not perceptibly produce any undesirable effects, unless given in doses too large, and then the effects noticed are systemic, on the eye, nose and throat, and not on the digestive tract.

Intelligent, specific regulation of general hygiene is especially beneficial. This must be

adapted to the individual case. Moderate setting up exercises, night and morning, directed at the abdominal and thoracic muscles and the restoration of good posture and carriage are indicated. Walking, in moderation, is beneficial, but games, played to the point short of fatigue and associated with alternate periods of rest, are better than set gymnastic exercises. Mental hygiene is as important as diet, drugs, and physical exercise, but can be prescribed intelligently only after a searching inquiry into the habits, industrial, social and domestic.

1720 *Connecticut Avenue, Northwest.*

A HUMAN MONSTER OF THE FOURTH WEEK.

By H. E. JORDAN, PH.D., University, Va.
Laboratory of Histology and Embryology, University of Virginia.

This specimen was sent to the Laboratory of Histology and Embryology for diagnosis by Dr. Ruth Spottswood Mason (Mrs. Grigg), of Petersburg, Va. The material consisted of a partially collapsed, thin-walled, glistening vesicle approximately 15 mm. in diameter, including internally a closely attached small, opaque, irregular mass about 1 mm. in diameter (Fig. 1). Examination of the specimen

Fig. 1.—Drawing of the complete ovum. The thin-walled, transparent, chorionic vesicle is devoid of villi. Near the upper pole appears an opaque trilobed mass, the atrophic remnant of an embryo, approximately four weeks old. Twice natural size.

in toto revealed no features clearly suggestive of an embryo. Microscopical preparations were made by Dr. Elizabeth Cole. A study of the sections leaves no doubt that we are dealing with an embryonic monster (Figs. 3 to 6).

The character and completeness of the clinical history render this specimen of considerable interest. The patient menstruated normally December 23rd. About January 23rd she began to have pronounced morning nausea. During February breast changes were noticeable. On March 1st, after a long automobile ride, a small blood stain showed on her clothes. She remained in bed for two days. On March 15th there occurred a profuse painless hemorrhage, lasting about thirty minutes, in which the specimen was passed.

This embryo obviously dates its beginning from a time prior to January 23rd. Assum-

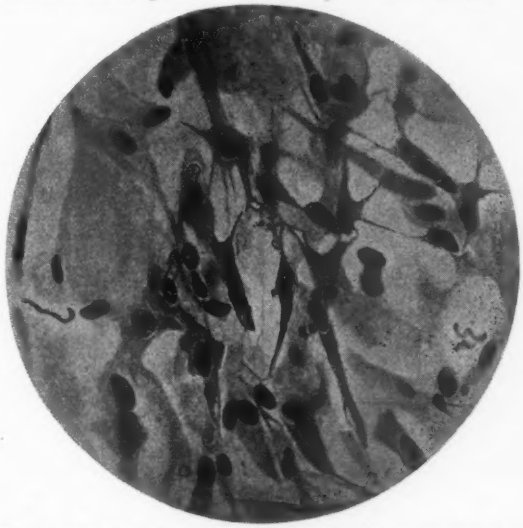

Fig. 2.—Drawing of a typical area of the chorion as seen in surface view. The tissue is beginning to show signs of slight dissociation. It consists exclusively of mesoderm.

ing that fertilization occurred about the tenth day after the last menstruation (January 2nd) this embryo has an absolute maximum age of approximately seventy-two days. On the assumption that fertilization occurred at the latest possible date prior to the suppressed menstruation the minimum age would be approximately fifty-four days. But even this age seems considerably in excess of the true age as judged from the sections. Assuming that the embryo died and began regression on March 1st when the initial hemorrhage occurred, the age would be approximately forty days. It seems clear from a study of the sections that the embryo had not attained even this developmental age prior to death. Since it contains a closed neural canal and a well developed notochord (Fig. 3), it must be older than the embryo Glaevecke of Von Spee which is estimated at twenty-two days. The size of the yolk stalk and of the allantois suggest a condition similar to the embryo Lr. of His, a specimen of about twenty-eight days. The size of the chorionic vesicle, assuming that it is expanded normally, suggests an age somewhere between the two embryos. All things considered, the embryo appears to have been about twenty-five days old when it entered re-

XUM

gressive stages. Atrophic changes therefore proceeded through a period of about thirty days.

Fig. 3.—Section through pharyngeal end of embryo. A portion of the chorion is shown below. The thin membrane overlying the embryo is portion of the amnion. The single-layered ectoderm is partially detached below at the right. The tissue is considerably macerated, including areas of complete disintegration. All lumens (spinal canal, pharynx, aorta and smaller blood vessels, heart, etc.) are more or less completely filled with distintegrating cells. The pedunculated mass below, at the left, may represent the heart. The central bilobed cavity is lined with dissociating columnar cells and represents the pharynx. The small, lightly-staining, circular area immediately dorsad represents the notochord. Peripherally, at the mid-point, appears the neural canal. The lining cells have filled the lumen, and the enveloping mesenchyme has suffered mucoid degeneration. The blood vessels contain disintegrating normoblasts. Magnified 100 diameters.

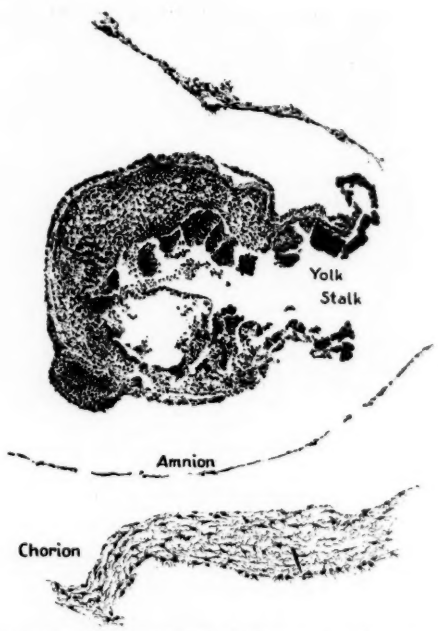

Fig. 4.—Section of the embryo in the region of the yolk stalk. The mesenchyme has suffered less dissociation at this level. The larger cavity represents the gastro-intestinal tract at the level of communication with the yolk sac. The embryo is distorted and evidently shrunken; in consequence the lining of the intestine has become extensively folded. The intraembryonic portion is lined with tall columnar cells; the broken remnant of the yolk sac (at right) with cuboidal cells. A small amount of smooth muscle is seen. Magnification 100 diameters.

SUMMARY OF CLINICAL HISTORY.

Last menstruation—December 23rd.
Morning nausea—January 23rd.
Breast changes—February.
Blood stain (after long automobile ride)—March 1st.
Abortion (with profuse painless hemorrhage for 30 minutes)—March 15th.
Absolute Maximum age of ovum = 72 days.
Possible minimum age = 54 days.
Absolute minimum age = 40 days.
Age estimated from degree of development = 25 days.
Duration of atrophic change = Ca. 30 days.

The history suggests the gradual operation of a morbid factor. Identification of this factor would supply the cause of this type of monster. Lesser degrees of expression of the etiologic factor would correspond roughly with successively lesser degrees of monstrosity and successively older abortuses, ending with viable monsters. The process may include a growth inhibiting effect of the causal factor. No doubt the embryo is more or less retarded in its development relative to its actual age. It may be dwarfed as well as monstrous. Mall[1] describes an embryo with a menstrual age of

Fig. 5.—Section through the caudal end of the embryo, close to the area of attachment to chorion. The central solid mass represents the embryonic end of the umbilical cord. The blood vessel (circular in section) at the left represents the umbilical artery. Note the blood vessels in the chorion at this level. The thin membrane at the upper pole represents the amnion. The central portion of the section, with the folded wall of tall columnar cells, represents the proximal end of the yolk sac. Magnification 100 diameters.

three months and a developmental age of three weeks. Taking these considerations into account, this embryo may be actually about eight weeks old, while developmentally only four weeks old. On this assumption, placental separation and consequent intraembryonic tissue changes may have been of only fifteen days' duration, the interval of time between the first sign of bleeding on March 1st and the abortion on March 15th. According to Mall,[1] gives no history of dysmenorrhea or vaginal discharge. Vaginal examination revealed no structural abnormality. Notwithstanding this history, fifteen months intervened between marriage and conception. With this as a clue, a mild endometrial inflammatory condition may be suspected.

The monstrous embryo here described has attained a degree of development comparable with a normal stage of about the twenty-fifth

Fig. 6.—Section through the region of the umbilicus, showing the connection between the short body stalk and the chorion. The body stalk contains an entoderm-lined duct, the allantois. The similar duct above represents the yolk stalk. Magnification 100 diameters.

detachment of a normal ovum for a much shorter time even than seven days is sufficient to cause an embryo to become monstrous.

Since the chorionic vesicle lacks villi it may be inferred that the locus of the initial morbid factor was extra-ovular, presumably endometrial. Such disturbance of the nutritive mechanism supplies sufficient cause for the stunting, malformation and partial disintegration of the embryo. In the search for the possible explanation of the disturbed nutritive conditions, the history of the parents becomes of prime importance. However, this history yields nothing to account for the presumably faulty implantation of the monstrous ovum. Both parents have given repeatedly negative Wassermanns. Children were desired, and contraception was not practiced. The woman

day. It is characterized by a bizarre trilobed shape, local necrosis, and considerable tissue dissociation. Its pathologic chorionic sac lacks villi and ectoderm. The embryo may have been retained an unusually long time after its death due to an unknown cause. The monstrous condition of the embryo may be interpreted as the result of "faulty implantation" (Mall), supporting an inadequate nutrition eventually leading to death. The unknown initial factor in the production of this monstrous embryo and its abortion presumably resided in some undiscovered pathology of the uterus or tubes.

REFERENCE.

1. A Study of the Causes Underlying the Origin of Human Monsters. *Jour. Morph.*, Vol. 19, 1908.

XUM

VINCENT'S GINGIVITIS.*

By A. M. SHOWALTER, M. D., Christiansburg, Va.

During the past year we have been very much impressed by the frequency of positive reports from the laboratory on smears from gums for Vincent's organisms. We are, therefore, adopting a laboratory examination of the gums as a routine procedure on all patients entering the hospital and of all the dental patients of Dr. P. L. Snuffer.

In this paper we do not wish to question the etiology of so-called "trench mouth"; however, it is well to bear in mind that at the present time it has not been definitely proven that the fusiform bacillus and spirillum of Vincent is the sole cause. Our temporary conclusions are based on our first 100 routine examinations, excluding cases that applied to us for treatment for sore, bleeding gums, etc. The smears we obtain are usually from both the incisor and molar areas and are stained with carbol fuchsin or gentian violet.

In the first 100 examinations 76 per cent showed the presence of both the fusiform bacillus and spirillum of Vincent. In 6 per cent the bacillus without the spirillum was found. In 35 per cent the Vincent's organisms were predominating. Twenty-five per cent had some clinical symptoms, such as bleeding or eroded gums. The remaining 10 per cent of the ones in which the Vincent's organism was predominating at the time the smear was taken had no clinical evidence of diseased gums. A few, however, gave a past history of sore and bleeding gums. In cases where the Vincent's organisms were not predominating a negative diagnosis was made; however, in about 10 per cent of these, the gums were clinically suspicious of "trench mouth".

To us these reports have been both surprising and startling. It brings us at once to the questions as to when it is necessary to institute treatment and when it is safe to allow cases to go untreated. So far we have treated only cases that were clinically positive, and, owing to no symptoms, a few of these patients have refused treatment. However, we are attempting to watch more closely over a long period of time the progress of the untreated cases in which the laboratory report was positive. Bloodgood reported in 1927 that Vincent's angina is markedly on the increase. The same year, Oadham and others reported likewise. It is true that there has been a "trench mouth" scare in our community during the past spring and summer, which may account for our abnormally high positive findings. Again, it might be mentioned that the majority of our patients are farmers, miners, etc., and as a rule practice very little oral hygiene. Even after taking this into consideration we are inclined to agree that it is on the increase and at an alarming rate. While the chronic cases seldom present direct symptoms severe enough to bring the patient to his physician for this alone, the end results of ill health, loss of teeth, etc., make it a responsibility to the physician to include a careful examination of the gums in all patients, and where a positive diagnosis is made to at least warn them of the tragic end results.

Many authors claim that Vincent's organisms are present in a non-pathogenic form in the mouth and genitalia of the majority of individuals. And our findings would seem to bear this out. In view of the frequent positive laboratory findings in cases where the clinical symptoms would not lead us to suspect "trench mouth", we naturally bring up the question of when and why they become pathogenic.

Certainly a lax oral hygiene predisposes to an attack; however, quite a few of our cases have been in patients who were extremely careful in regard to brushing their teeth, etc. Chronic, debilitating diseases have also seemed to lower a patient's resistance to the infection, and we have had two operative cases during the past six months who developed an acute form within the first week following operation.

Numerous treatments have been reported to be successful, chief among them being the arsenicals. Our present line of treatment which is so far the most successful we have employed is a solution of wine of ipecac, glycerine, and Fowler's solution, applied directly to the gums twice a day, a mouth wash of sodium perborate twice daily, and some form of arsenic either sub-cutaneously or intravenously about twice a week.

The local applications are used often enough to clear up the immediate symptoms; however, we find that unless these are carried out in conjunction with systemic treatments there is almost always a recurrence of the symptoms. Occasionally a 10 per cent solution of

*Read before the Southwestern Virginia Medical Society, at Wytheville, Va., September 27-28, 1928.

neo-silvol, either in water or glycerine, is applied locally to the gums.

Conclusions

1st.—Vincent's gingivitis is markedly on the increase.

2nd.—In the chronic form the symptoms are so mild as to often be overlooked by both patient and physician.

3rd.—More research work is necessary to determine both the predisposing and exciting causes.

New Altamont Hospital.

SALIVARY CALCULUS.
A Case Report.

By J. B. H. WARING, M. D., Cincinnati, O.

Salivary concretions of various sizes at times form in the parotid gland and Stenson's duct; but a majority of such calculi are found in Wharton's duct, leading from the maxillary gland. Stenson's duct opening from the parotid is opposite the second molar of the upper jaw; while Wharton's duct opens under the tongue and frenum. Both openings may be entered with a probe or fine needle, for diagnostic or therapeutic purposes.

Where the parotid is involved, inflammation and enlargement of the gland may take place, with retention of saliva.

Klebs and Waldeyer assert that masses of micro-organisms are the chief etiological factor in formation of salivary calculi, with deposition of the phosphates and carbonates of lime, magnesia, soda, etc., to gradually form calculi. Stones as large as eggs have been reported; at times multiple, and occasionally faceted. A majority of these calculi are somewhat milk white in appearance; friable, and often capable of being crushed between the fingers. Where inflammatory reaction proceeds to abscess formation, a spontaneous rupture with evacuation of contents may take place, a salivary fistula being the end result.

The condition undoubtedly develops far oftener than the average physician would suspect; and unless marked inflammatory reaction develops, is often unrecognized. Calculi may remain small and silent for long periods of time, or the ducts may rupture, with evacuation of contents unrecognized as such by the patient. While surgical intervention is uncomplicated, as a rule, an occasional case may cause trouble. In a case seen by us in New York several years ago, a calculus in Wharton's duct was recognized upon roentgenogram of the jaw for other purposes; and easily removed under local anesthesia. A deep-seated cellulitis of the cervical tissues followed, however, and for several days it appeared a fatal issue would be the outcome. The calculus in this case was small, irregular in shape, milk white in color and so friable as to be easily crushed between the fingers.

Case Report

C. G., a farmer, aged 57 years, consulted us for a "lump in his throat", which was sore at times, and made swallowing difficult when sore. No swelling was observable externally; but upon intra-oral digital examination under the patient's guidance, a hard mass was easily felt on the right side of the floor of mouth between the tongue and maxilla. This was roughly somewhat larger than a pigeon's egg, apparently smooth, and only painful on deep pressure. No fluctuation was detected. X-ray was advised, but discouraged by patient from financial reasons.

Previous history was negative, except that patient stated that about twenty-five years previously the whole right side of his face and tongue swelled up, becoming hard and painful. After about ten days, the inflammation gradually subsided. His physician was of the opinion the salivary duct was stopped up; while a dentist thought a tooth was causing the trouble. Being prior to the Roentgen ray era in the rural districts, no further study of the case seems to have been made, as the trouble seemed to be abating under such measures as his doctor applied. At intervals since this initial attack, patient reports his neck and side of face would swell up and become painful, but mildly in comparison with his first experience, and these attacks seemed to be controlled by liberal application of tincture of iodine.

About three years ago, however, patient reports that the lump in his mouth began to get noticeably larger; hurt him considerably at times; and was more or less tender on pressure all the time. No further consultation of his physician seems to have been secured. Only lately has patient noticed difficulty in swallowing; but two or three days before coming in, patient states that the lump in his throat seemed so large and sore that he had more difficulty than ever in swallowing.

After surface anesthesia of the oral mucous membrane over the mass, and careful digital

XUM

examination, a tentative diagnosis of salivary calculus was made. This was confirmed when the needle of a novocain-filled syringe was carefully thrust into the swelling, for purposes of infiltration anesthesia. By pressure externally under the jaw, the mass was prominently thrust up into floor of mouth, an incision made over same, and the calculus delivered with forceps. This was perfectly smooth to the touch; but yet was a dark brownish red mottled color over its larger end, shading towards a lighter mottling at its apex. This mottling was so pronounced as to give the calculus a mulberry-like appearance all over. In general size it was as large as a pigeon's egg, but not so symmetrical in outline. Unlike so many salivary calculi, it was very hard, and in place of a milky white bluish tinge often met with, was a dark mottled red. Superficially the calculus

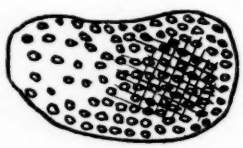

Fig. 1.—Approximate size and shape of salivary calculus.

resembled certain forms of vesical calculi far more than it did a salivary concretion.

Aside from its size, shape and color, the interesting clinical feature of this calculus was its tolerance by the tissues over a period of some twenty-five years and its comparatively slow growth. Why this prolonged irritation and repeated inflammatory reactions did not eventuate in a malignancy is difficult to understand.

Recovery was entirely without incident. The pocket left by the calculus was swabbed out with mercurochrome solution; kept clean of food particles; and an antiseptic mouth wash prescribed. Otherwise, it was left to itself.

REFERENCE.
Sajou's Cyclopedia of Medicine, Vol. V, pp. 519-520.

7 *East McMillan Street.*

Do, whatever task you have to do, to the best of your ability. It is almost certain that the other fellow is doing his level best.

AN ADDRESS ON PRESENTING THE PORTRAIT OF DR. ISRAEL BROWN— AS A GIFT FROM MISS RACHEL BROWN— TO THE NORFOLK COUNTY MEDICAL SOCIETY.*

By NATHANIEL T. GREEN, Norfolk, Va.
Attorney at Law.

MR. PRESIDENT AND MEMBERS OF THE NORFOLK COUNTY MEDICAL SOCIETY:

On such an occasion as this it is not to be expected that the speaker will tell his audience the life history of the man whose portrait is to be presented to you. Most of that life-history—certainly the adult and important portion of it—was spent among you: and you, as members of the same profession with him, know more of his daily walk and work through that period than can possibly be related to you by an outsider in such a space of time as I can here and now reasonably consume. So, my audience need not look for any attempt to tell Dr. Brown's career in what I have to say this evening. That career was too active, too various, and too full to admit of being portrayed justly in an address of this kind.

Again, this may be positively asserted as a characteristic of Dr. Brown—that he disliked to hear fulsome and indelicate praise of himself from others. By nature, modest and retiring, he preferred the satisfaction that comes from the inner consciousness of work well done and duty performed rather than the oral utterances of laudation and flattery which not infrequently caused him to blush with embarrassment and confusion. And so, if he could be consulted now, he would desire, I am sure, that I indulge in no undue eulogy and adulation of him. And what he did not like when he was alive, I will not presume to offer, now that he is no longer with us.

But Israel Brown's life on earth was of a kind that invites an investigation of those mental and moral attributes that made of him a man of character and ability, for in these attributes there will be found qualities not only to inspire but to be emulated by physicians, by soldiers, by officeholders, and by men in every walk of life. And it is of these attributes, which I came to know from a close and intimate association of a decade with him, that I shall talk to you tonight.

John Ruskin, in one of his most eloquent essays—that one on "Work"—divides work

*Address delivered before the Norfolk County Medical Society at a Memorial Meeting, May 6, 1929.

into two kinds: "Wise work and foolish work" and the difference between the two, as he puts it, is the "difference between sense and nonsense in our daily occupation." And he goes on to tell us what wise work is: "Observe, then," he writes, "all wise work is mainly threefold in character. It is honest, useful and cheerful." That essay has been for many years a favorite with me, and I had not known Israel Brown long before I placed him in my mind as a man of whom Ruskin would declare he did wise work in his life, that is, work that was honest, useful and cheerful. And the longer I knew him the more convinced I was that I had given Dr. Brown the proper place, in this, my idea of him.

There was no pretense about Dr. Brown; his was not the nature to shirk or slur over any task that fell to his lot; he looked the facts of every situation squarely in the face and set to work to meet them like a man; he went honestly to work to cope with those facts as efficiently as he could, and there was no temporizing, no shutting of his eyes, no deceiving himself as to what really confronted him. And this was true no matter what the nature of the work: Whether as a physician he attended some poverty-stricken patient suffering from the agonies of carcinoma or some other fell disease; or whether as an army surgeon he saw too plainly the result to some boy of a wound from the fire and missiles of the enemy; or whether in political life he saw some unworthy and injurious piece of legislation about to be enacted; or whether as a member of the school board he saw something amiss about to be accomplished; or whether as a member or State Commander of the American Legion, he was seeking to promote the welfare of disabled veterans; or whether as a member of your society or of the State society, or as one of a committee of these, he perceived anything to be as it ought not to be. In all these various spheres of life, Dr. Brown always presented this same characteristic of meeting the question face to face and solving it, if it could be solved, by direct and open action. Throughout his entire life Israel Brown was doing honest work in an honest, upright way. It cannot be doubted, therefore, I think, that Israel Brown's work in life was in part wise work because it was honest work.

But this life work of Dr. Brown was not only honest work, it was useful work. And in the essay from which I have quoted, Ruskin tells us: "Then, secondly, wise work is *useful*. No man minds, or ought to mind, its being hard, if it only comes to something; but when it is hard, and comes to nothing; when all our bees' business turns to spiders'; and for honeycomb we have only resultant cobweb, blown away by the next breeze—that is the cruel thing for the worker." No one ever heard of Dr. Brown's complaining that his work was hard; and work was never a cruel thing to him. The reason for this, as Ruskin points out, was that Dr. Brown's life work was useful work; it was work that came to something. It came to this, in Dr. Brown's work as a physician, it relieved often and over again the ills of the body accentuated by the ills of poverty, and it carried hope and often safety to people in despair and disconsolate. His main work in life was, of course, in that sphere, but the work he did in any capacity that was designated for him was always useful work. Even as a member of any committee of your society to which he had been appointed, Dr. Brown always did more than his part, and what he did was always helpful and useful. For several years prior to his death, Dr. Brown had been intensely interested in the library of this society; he was on the alert to discover old and rare medical works for it, and he was particularly keen to gather all he could relative to any former physician who had in times long gone practiced in this vicinity. He wished that library to contain not only the new but the old, so that members could see the great changes that the new had wrought by viewing the old—in other words to have at their hands the history of medicine. It is gratifying to know, in view of this interest of his later years, that you are to place the picture I am about to present you in your library. In every sphere of life, then, we may say that Dr. Brown's work was useful work and to that extent also was wise work.

And, finally, my friends, I think we may say, without the fear of cavil or contradiction, that Dr. Brown's work in life was cheerful work, that is, that he did what he had to do cheerfully. If ever there was a cheery man among men, Dr. Brown was he. His face fairly beamed with cheer and good-will—not an empty unmeaning smile and a forced twinkle in the eyes, but a smile and twinkle that radiated from an honest nature ready always to do what it could to help any good cause on

XUM

its way, or to benefit his fellow-men. Ruskin compares the nature of the cheerful worker to that of a child "being full of love to every creature, it is happy always, whether in its play or in its duty." And he goes on in eloquence scarcely ever excelled: "Well, that's the greatest worker's character also. Taking no thought for the morrow; taking thought only of the duty of the day; trusting somebody else to take care of tomorrow; knowing indeed what labor is, but not what sorrow is, and always ready for play—beautiful play—for lovely human play is like the play of the Sun. There's a worker for you. He, steady to his time, is set as a strong man to run his course. See how he plays in the morning with the mists below and the clouds above, with a ray here and a flash there and a shower of jewels everywhere; that's the Sun's play; and great human play is like his—all various—all full of light and life, and tender as the dew of the morning." I like to recall my departed friend with this language in my mind. He was steady as a strong man to his work, but he was always in the intervals scattering a ray here and a flash there of the cheerfulness which was a part of his nature.

My friends, Dr. Brown did in his life-time that wise work that Ruskin defines as "work that is honest, useful and cheerful," and this is a goal that every man can set before him as worthy of a high ambition. To that goal he attained.

There was another quality of our friend's character that cannot be passed over in silence: That was an entire absence of any mercenary motive in any work he ever undertook. Dr. Brown did not hate—for he never hated,—but he did not admire those features of professional life in which the fee played the first part. He did not admire the many little tricks and devices by which occasional professional men seek to increase their practice. He scorned to stoop to these. And as he grew older, the less he thought of the habit of accumulating money. He was spending what he had, and that was no large amount—in fact, a mere bagatelle to what it would have been had he devoted his professional life to money-making. All this is in keeping with the character of those who do the wise work in this life of ours. Listen once again to Ruskin on this subject:

"There will be always a number of men who would fain set themselves to the accumulation of wealth as the sole object of their lives. Necessarily, that class of men is an uneducated class, inferior in intellect, and more or less cowardly. It is physically impossible for a well-educated, intellectual, or brave man to make money the chief object of his thoughts; as physically impossible as it is for him to make his dinner the principal object of them. All healthy people like their dinners, but their dinner is not the main object of their lives. So all healthily-minded people like making money—ought to like it, and to enjoy the sensation of winning it; but the main object of their life is not money; it is something better than money. A good soldier, for instance, mainly wishes to do his fighting well. He is glad of his pay—very properly so, and justly grumbles when you keep him ten years without it,—still his main notion of life is to win battles, not to be paid for winning them. So of clergymen. They like pew rents, and baptismal fees, of course; but yet, if they are brave and well educated, the pew rent is not the sole object of their lives, and the baptismal fee is not the sole purpose of baptism; the clergyman's object is essentially to baptize and preach, not to be paid for preaching. So of doctors. They like fees no doubt,—ought to like them; yet, if they are brave and well educated, the entire object of their lives is not fees. They, on the whole, desire to cure the sick; and, if they are good doctors, and the choice were fairly put to them, would rather cure their patient, and lose their fee, than kill him, and get it. And so with all other brave and rightly trained men; their work is first, their fee second—very important always, but still *second*. And this is no small distinction. It is the whole distinction in a man." Dr. Brown's work was never mixed with any idea or thought of what his pecuniary remuneration for it might be. His work came first and his fee was not even second.

Dr. Brown had a faculty for friendship. He made friends readily and he kept them steadfast. This was due to his friendliness and sincerity. He could not, even in political life, dissemble. If he kept silent on a subject because there was no duty on him to express an opinion on it, yet the play of his features and the expression on his face at once disclosed where he stood and what his views were. This transparent honesty was his chief political asset. No pressure of personal influence ever budged him a hair's breadth from convictions he had formed after deliberately

considering a matter. And he knew enough of human nature and of the wiles and ways of men not to be beguiled or fooled into unjustifiable and wrong positions on any public questions. In one respect there was a great difference in the political views of Dr. Brown and myself. He believed, and I did not, in what is generally termed humanitarian and uplift legislation, and that it was a duty of the State to go as far as its pecuniary resources would allow in that direction. This difference was no doubt due in part to what Dr. Brown had seen of life in his capacity as a physician and to his desire to elevate his fellow men. He may have been right and doubtless I was wrong; at any rate, he was with the forces of what is termed progress, and I, if not an antique, was antiquated in the matter. I believe, indeed, that I may assert that all real physicians have now become by training and experience humanitarians, and this even to the diminishing of their professional income.

And so, in every relation of life, it will be found that Dr. Brown's characteristics were the same. He was not only honest in the ordinary sense of that word, but he possessed a higher integrity than that, for he was intellectually honest; he not only was not led astray by the arguments and persuasions of others, but he never persuaded himself by specious excuses and false logic from the conclusion of his own sound judgment. The work he did in life was, therefore, necessarily honest and honorable work. His was again a highly practicable mind and he rarely indulged in mere speculative and academic discussions. He met with enough concrete questions in his daily life to give him more than a plenty for hard thought, and he devoted his mind to the solution of those questions that so continuously arose. The consequence was that those thoughts of his assumed quickly the form of actions and thus became useful and serviceable to his fellow men. And so his work was useful work. And, again, Dr. Brown loved his work and as he was by nature of a disposition far removed from the morose, he did what he had before him cheerfully and willingly. In fine, Dr. Brown worked with real wisdom in this world of ours.

It is the likeness of this man—the features and lineaments of his kindly and candid face clearly reproduced—that I present to this Society—of which he was formerly President—as a gift from his sister, Miss Rachel Brown. It has not been an irksome or disagreeable, but, on the contrary, a pleasing, undertaking to me to act for her in formally presenting it to you. I am proud that I should have been selected for that purpose—a pride increased by the fact that a former President of your Society informs me that Dr. Brown himself not long before his death said to him that in that event he wished me to say something to this Society relative to the manner of man he was. An acquaintance and intimacy with Israel Brown was helpful to every man who enjoyed it; he shattered the cynical in many a man by demonstrating in his own life and character how much of goodness, benevolence, and charity there was in human nature, and he did this without knowing it.

He was an honor to the medical profession, a soldier at his country's call, a legislator of unblemished integrity, but above and beyond all these he was, like Ben Ahdem, "one who loved his fellow man."

Mr. President and Members of the Norfolk County Medical Society, acting for Miss Rachel Brown, I present you this portrait of her beloved brother, Dr. Israel Brown.

AN ADDRESS ON PRESENTING THE PORTRAIT OF DR. EDWARD EVERARD FIELD TO THE NORFOLK COUNTY MEDICAL SOCIETY.*

By EDMUND S. RUFFIN, JR., Norfolk, Va.
Attorney at Law.

LADIES AND GENTLEMEN AND MEMBERS OF THE NORFOLK COUNTY MEDICAL SOCIETY:

I am sorry that the honor which has devolved on me tonight in presenting to this Society a portrait of Dr. Edward Everard Feild, did not come to someone more competent than I, as I never knew Doctor Feild until his latter days, and I do consider that I am greatly honored by this occasion, because I liked and admired Doctor Feild very much.

Edward Everard Feild was born on April 11, 1855, at the old Wyatt Homestead, called "Walnut Grove," in Greensville County, Virginia. He was the fifth child of George Wythe Feild and Anne Wyatt Feild. On his father's side he was of Welch ancestry. His great grandfather, Richard Feild, was a surgeon in the Revolutionary Army. On his mother's side, he was a lineal descendant of Sir Francis Wyatt, one of the early Governors of Vir-

*Address delivered before the Norfolk County Medical Society at a Memorial Meeting, May 6, 1929.

ginia. He was related to George Wythe, George Keith Taylor, the Bollings, Meades, Randolphs, Stiths and other prominent families of Virginia. He was also descended from Sir Richard Everard, one of the Colonial Governors of North Carolina. Through the Rolfes and Westwoods he was descended from Pocahontas.

His boyhood was spent at home and his early education was received at a little log school house five miles away, conducted by Mr. Samuel Hardy. He then attended the private school of R. M. Carey, in Petersburg, and later went to the Pine Grove Academy, at Greensville, Virginia. In 1878, he entered the University of Virginia and graduated in 1879 with the degree of M. D.

Upon leaving the University of Virginia, he began the practice of his profession at Hicksford, now Emporia, Virginia, where he spent four years, associated with Doctor Edmund Mason, after which he came to Norfolk, and spent the remainder of his life here.

Doctor Feild had a long and distinguished career in Norfolk. He was an active practitioner here for more than forty years, and during that time he held numerous positions of importance. He was for years the State Quarantine Medical Officer of the Port of Norfolk. He was also Acting Assistant Surgeon in the U. S. Marine Hospital Service, now called the U. S. Public Health Service. He was at one time President of the old Norfolk Board of Health, and this was the only political office he ever held. He was also the Surgeon for the British Vice-Consulate, at Norfolk.

Immediately after his arrival in Norfolk, Dr. Feild associated himself with St. Vincent's Hospital, and became a member of its staff, and served as such for over forty years. He assisted in the formation of the Clinic there and was head of the Surgical Department. He was devoted to this institution and was always active in its charity work.

The first operation for appendicitis performed in Norfolk was done by Dr. Feild, at St. Vincent's Hospital. In 1894 he was awarded the Hunter McGuire Prize for an Essay on Appendicitis. He also wrote a number of papers on various medical subjects. Dr. Feild was considered a master in operations for hernia. In his later life he took postgraduate work in Orthopedics, at Boston, and specialized in that branch of the medical science until he was incapacitated from practice by a stroke of paralysis. He retired from active practice about four years before his death, and he died at St. Vincent's Hospital May 30, 1928. He never married.

Dr. Feild took a prominent part in many of the organizations of the medical profession. He was a member of the Norfolk County Medical Society (this distinguished and honorable body), of which he was at one time president. He was also a member of the Medical Society of Virginia, the Seaboard Medical Association, the American Medical Association, and of the American College of Surgeons. He was also elected a member of A. A. A., the honorary medical fraternity, by the University of Virginia Chapter in 1922.

Although Dr. Feild graduated from college in medicine half a century ago, yet he kept up with the tremendous advance which this science has made.

Dr. Feild's attainments were not confined to the medical profession only. He was a cultured, refined and educated gentleman. He enjoyed immensely the society of his friends and he belonged to many social organizations. He was a member of the Old Virginia Club, Norfolk Boat Club, Norfolk Gun Club, Norfolk Country Club, and Atlantic Club of Virginia Beach. He was a Mason, belonging to Owen Lodge, of which he was Past Master (1891-2). He was a devoted member of St. Paul's Church, and at one time a vestryman.

He loved music, painting and literature. He was an inveterate reader. He was a good conservationalist, and quite witty, and therefore a delightful companion.

The picture which I have the honor of presenting to you tonight, in behalf of his niece, Miss Annie Feild, is an enlargement of an old photograph which appeared in a publication called "The University of Va.," Vol. II, page 135, published in 1904, of which Dr. Paul Barringer, Jas. Mercer Garnett and Rosewell Page were the editors. Dr. White found a copy of this work in an old book shop here, and we borrowed it and had the photographer photograph the picture and then make an enlargement of it. This was the only means available for securing this picture and I judge it represents Dr. Feild as he looked about twenty-five years ago.

I think I would be remiss if I should close without stressing the unselfishness and charitableness of Dr. Feild. Money was no object

in his life, nor did any man's wealth or poverty influence him. His greatest joy was in rendering service to those who needed it. Doubtless there are some present here tonight who will remember encouragement, sympathy, and real assistance given them by Dr. Feild when they were beginning life as young doctors.

Correspondence

Dr. Williams Discusses Attitude of State Department of Health to Curative Clinics.

The following is the copy of a letter recently written by State Health Commissioner, Dr. Ennion G. Williams, and it is published here for information of physicians of the State in general.

May 9, 1929.

To the Members of the Otolaryngological and Ophthalmological Society of Virginia:

On April 23rd I addressed to your society a letter which was read at your recent meeting. Since some of the members of the society were absent, I am sending to each member this communication which embodies the substance of my letter to the society.

Inspections of our school children have for years been revealing conditions calling for a remedy. Our representatives requested your society to formulate a system under which those conditions could be remedied; and we are grateful to you for doing so. However, when we began to realize our definite responsibility under your resolution, we hesitated and determined to give more careful consideration to the subject.

In public health work we have to consider the rights and the duties of three classes—the public, the medical profession, the State as represented by its health department. There are certain lines of preventive work which the public has the right to demand from the paid health workers, there are other lines in which the officials should, at the most, be intermediaries between the profession and the public. The medical profession has rights which health departments must respect; and one of these rights is to get fair pay for all private service rendered. For the State to assume control over the compensation to be paid to the doctors is a step toward the rendition of private service through public agencies. This is so-called State medicine, something all of us wish to avoid.

It is curious, but nevertheless true, that a health department which acts as an intermediary is subjected to the criticism of profession and of public. The doctors think, and not without reason, that we endeavor to keep their fees to a minimum. We have to do that if we are to get the work done on such a scale as to justify our taking any interest in it from a public health standpoint; yet it is questionable whether we are justified in so doing. We do not undertake such services in connection with diabetes or cancer or heart disease; and I do not believe that any doctor would seriously suggest that we should. Then why should we do this for nose and throat troubles, which are not communicable but strictly personal? On the other hand, the public with far less reason but more loudly condemns us for conducting our health work in the interest of the doctors.

We believe that this work should be done. We have not changed our opinion in that respect but we believe it should be done through some mutual arrangement between family doctor and specialist when a small number are involved or between the local medical society and the specialist when there is a larger number. If the local doctors wish the help of our field nurses, such help will be given; but this is, we think, just as far as we should go in assuming any responsibility.

At more than one meeting of the Medical Society of Virginia, the writer has discussed the legitimate boundaries of public health activities, but he has never considered that the holding of curative clinics has fallen within the category of the legitimate. We are anxious to afford a measure of relief to children handicapped by remedial troubles and yet who are distant from those specialists qualified to give relief; but we think that the extent of our efforts for assistance is to give our moral support to those who are able to give tangible aid and not to assume responsibility for such service unless specifically requested and advised to do so by the organized profession.

I trust that you will understand our position and will not think us ungrateful.

Very sincerely,

ENNION G. WILLIAMS, M. D.
State Health Commissioner.

XUM

Woman's Auxiliary, to the Medical Society of Va.

A Letter to the County Chairmen of Health Education:

It is hoped that each County Chairman of Health Education will make a thorough study of the health conditions in her city or county, and that there will be a good report for the next State meeting.

Every community must have an official scientific Health Department, and the Auxiliary's first, and most important work, is to secure such a department where it does not already exist. If there is an official department with full time trained workers, lay organizations, like ours, should cooperate and be willing to take advice from them.

To study the different phases of health work I would suggest the forming of the following committees:

1st; a Committee to study the Health Department and the conditions in the County. Go to the Health Officer and offer the services of the Auxiliary to do any work he deems best.

2nd; a Committee to study the milk and water situation.

3rd; Tuberculous Education: to see that the really dangerous advanced cases are being properly taken care of, and are not spreading the disease in our homes through servants and others. Does your County give these cases hospital care? Insist upon having outdoor school rooms, and rest periods during hours for tuberculous children. Teach them the proper way of living.

4th; Cancer Control: "The American Society for the Control of Cancer has asked the Auxiliary to assist in this work. Learn who is the Medical Chairman of this work in your County. Appoint a Committee (who can talk), send for literature, study the work, and bring it to your own Auxiliary. Educate them first—and send them to clubs and other organizations.

5th; Child Welfare: have this Committee find out how the work is conducted in your County, and how the Shepherd-Towner money has been spent. The Shepherd-Towner Bill and the Newton Bill provides for "Child Welfare and other services," which means that this money may be used for anything, and under the Department of Labor. There is a more recent bill which places this money under the Department of Public Health, which is what the A. M. A. wants. The Auxiliary should cooperate with the Board of "Health Division of Hygiene" by promoting "May Day," and assisting with the pre-school child health examination, directing our efforts toward sending children to their own family physicians for examination instead of to clinics. Doctor's wives, as members of the Parent-Teachers Association, can influence mothers to have all defects corrected before school begins.

6th; organize Study Clubs and Health Education programs for the benefit of Auxiliary members and other women, to encourage annual examinations to detect and check signs of disease.

7th; a Committee to provide "Health Programs" for Woman's Clubs and other organizations. (These will be sent you on application to the A. M. A. Office in Chicago.)

If there is any way that I can assist, please call on me.

Faithfully,

ALICE LEIGH,
(Mrs. Southgate Leigh.)
Chairman Health Education, Woman's Auxiliary to the Medical Society of Virginia.

The card party, sponsored by the Woman's Auxiliary to the Richmond Acadmey of Medicine was a big success in spite of the unfavorable weather.

It was planned to be given on the lawn, at "Beaumont," the home of Mrs. Stuart Michaux, president of the auxiliary, but on account of rain it was postponed until June 3rd. Due to weather conditions, it was held at the Mosque Theatre.

Much credit was due Mrs. N. T. Emmett and Mrs. W. T. Sanger, who had charge of the tables, Mrs. Armistead Gills, chairman of refreshments, and Mrs. Joseph Bear, of prizes. The auxiliary wishes to extend thanks to them and to all who assisted in making the party so enjoyable for all present.

The money realized from the affair will be used in securing the much needed linen and clothing for the Dooley and St. Phillip's Hospitals. This work has recently been assumed by the auxiliary, and much interest and enthusiasm has been shown.

It is sincerely hoped that with this objective, our organization will grow and realize its usefulness and importance.

The Truth About Medicine

In addition to the articles enumerated in our letter of March 30th, the following have been accepted:

Abbott Laboratories
  Bismarsen
Ciba Co., Inc.
  Digifoline-Ciba
    Digifoline—Ciba Liquid
    Ampules Digifoline—Ciba Solution, 1 cc.
    Ampules Digifoline—Ciba Solution, 5 cc.
    Tablet Digifoline—Ciba
Parke, Davis & Co.
  Diphtheria Toxoid
E. R. Squibb & Sons
  Insulin—Squibb, 80 units, 10 cc.
Winthrop Chemical Co., Inc.
  Tablets Theocin Soluble, 2½ grains

NEW AND NONOFFICIAL REMEDIES

Lenigallol.—Triacetylpyrogallol.—Lenigallol is said to be nonpoisonous and nonirritating, but it produces a mild and painless corrosive effect by the gradual liberation of pyrogallol. It is used as a substitute for pyrogallol in psoriasis, lupus, acute and subacute eczema of children and other skin diseases. E. Bilhuber, Inc., New York.

Solution Bismuth Sodium Tartrate—Searle, 1-5 per cent.—An aqueous solution containing bismuth sodium tartrate—Searle (Jour. A. M. A., June 30, 1928, p. 2103) 0.015 Gm., benzyl alcohol 0.02 Gm., and sucrose 0.25 Gm., in one c.c. G. D. Searle & Co., Chicago. (Jour. A. M. A., April 6, 1929, p. 1181.)

Magnesia-Mineral Oil (25) Haley.—A mixture composed of liquid petrolatum, U. S. P., 1 part by volume; magnesia magma, U. S. P., 3 parts by volume. It is used as a lubricant in the intestinal tract for promoting evacuation of the bowel and as an antacid for the gastro-intestinal canal. The Haley M-O Co., Inc., Geneva, N. Y.

Sulpharsphenamine—Searle.—A brand of sulpharsphenamine—N. N. R. (New and Nonofficial Remedies, 1928, p. 81). It is supplied in 0.4 Gm., 0.5 Gm. and 0.6 Gm. ampules. G. D. Searle & Co., Chicago.

Diphtheria Toxin-Antitoxin Mixture (Diphtheria Prophylactic).—A diphtheria toxin-antitoxin mixture (New and Nonofficial Remedies, 1928, p. 366), each c.c. representing 0.1 L—dose of diphtheria toxin neutralized with the required amount of antitoxin. It is marketed in packages of three 1 c.c. vials, in packages of one 15 c.c. vial; in packages of one 30 c.c. vial, and in packages of thirty 1 c.c. vials. National Drug Co., Philadelphia. (Jour. A. M. A., April 20, 1929, p. 1349).

PROPAGANDA FOR REFORM

Food Value of the Papaya.—Certain proprietary houses have capitalized the use of the dried juice of papaya (*Carica papaya L*) because of the ferment it contains, "papain." Papain has some of the properties of pepsin, but its digestive power is uncertain and feeble. As far as proprietary papaya preparations, which are claimed to contain the active principle, are concerned, the Council on Pharmacy and Chemistry voted as long ago as 1914 not to admit papaya preparations to New and Non-official Remedies. (Jour. A. M. A., February 23, 1929, p. 672).

Contraindications to Salyrgan.—Salyrgan is a complex synthetic mercurial which is contraindicated in acute nephritis and in the more severe chronic forms with nitrogen retention in the blood. In other cases of edema it may safely be employed in an initial dose of 0.5 c.c. of the 10 per cent solution given intramuscularly or intravenously and increased to 1 or 2 c.c. if required; injections are made at intervals of from three to five days. The preparation is marketed by H. A. Metz Laboratories, Inc., of New York. (Jour. A. M. A., February 23, 1929, p. 673).

Neisser (Gonococcic) Vaccine and Erysipelas Vaccine (National Drug Co.) Not Acceptable for N. N. R.—The Council on Pharmacy and Chemistry reports that the National Drug Co., Philadelphia, markets Neisser (Gonococcic) Vaccine and Erysipelas Vaccine. In 1924 the Council omitted from New and Non-official Remedies all gonococcus vaccines and in 1925 it omitted all streptococcus vaccines because experience with such preparations had not established their value and because the Council's consultants concluded that they had no field of usefulness In accordance with this action, the Council declared the preparations of the National Drug Co., inadmissible to New and Non-official Remedies (Jour. A. M. A., January 5, 1929, p. 44).

Tartaroff.—This is exploited as a "marvelous discovery" that "acts like magic on the teeth," "Tartaroff is the greatest scientific discovery of the age. Nothing like it ever prepared before. It is not a tooth paste but a simple, harmless preparation that can be applied to the teeth in a few seconds. Immediately the teeth are transformed into gems of pearl white beauty." From the analysis of the American Dental Association it appears that Tartaroff is, for all practical purposes, a mixture of hydrochloric acid and water, with a little coloring matter added. The claim that a 1.2 per cent solution of hydrochloric acid is harmless to the teeth is pernicious to a degree. (Jour. A. M. A., January 5, 1929, p. 73).

Narcosan and Drug Addiction.—Narcosan is the "discovery" of one A. S. Horowitz, who came to the U. S. in 1913 and has been more or less continuously identified with attempts to promulgate cures for all sorts of disorders. There was the Horowitz-Beebe treatment for cancer known as "Autolysin," there were the Merrell Proteogens for the treatment of practically everything, and, finally, there was Narcosan, originally brought out about 1920 under the name "Lipoidal Substances." Lipoidal substances was not accepted by the Council on Pharmacy and Chemistry, because it was of unestablished composition and the clinical reports were not convincing. In 1926 an article appeared on the subject of Narcosan, which paper had previously been rejected by *The Journal of the American Medical Association.* Since then sensational newspaper articles about Narcosan have appeared. Now a preliminary report of the Mayor's Committee on Drug Addiction of the City of New York has been published. It is signed by the chairman of the committee, Dr. Alexander Lambert, who was one of the authors of the favorable report on Narcosan published in 1926. The committee report is summed up in the closing clause: "Narcosan has no merit as a specific treatment of drug addiction." (Jour. A. M. A., January 12, 1929, p. 151).

"Influenza Serobacterin Mixed."—A Revival.—In 1918 the Council on Pharmacy and Chemistry denied admission to New and Non-official Remedies of "Influenza Serobacterin Mixed—Mulford," holding that there was no evidence for the value of the mixture

XUM

and that its use was illogical. Since then nothing has happened to question the soundness of this judgment of the Council. Nevertheless, a circular letter sent to a large industrial concern conveys the impression that "Influenza Serobacterin Mixed" is an effective means of checking influenza and of treating respiratory infections. The apparent conviction by the promulgators of "Influenza Serobacterin Mixed" of the value of their preparation is not the slightest guarantee of their truth. This is merely an ill-considered crude revamping of old notions and phrases, surviving in discredited advertising matter, and now revived during a period of public fears in time of epidemic. (Jour. A. M. A., January 19, 1929, p. 233).

More Influenza Vaccine Propaganda.—As might have been expected from previous activities of the firm, among the earliest to enter the field in an endeavor to promote vaccine products during the current influenza epidemic, has been the G. H. Sherman Company, of Detroit. In 1924 the Council condemned the firm's influenza vaccine, particularly because of lack of evidence in its support, and all of the mixed vaccines in general because their use is not in the interest of sound therapy and public health. The more recent literature circulated by Sherman includes the claim that records of Drs. Don C. Sutton, Frederick Tice, Alexander Lambert and William O'Neill Sherman constitute suitable evidence in support of the use of the prophylactic vaccine against this disease. Letters from Drs. Sutton and Sherman cast considerable doubt not only on the statistics and statements cited by G. H. Sherman, in support of the use of his preparations but also on the right of that concern to use the material in advertising. For some years the products of G. H. Sherman have not been advertised in any of the publications of the American Medical Association and none stand accepted for New and Non-official Remedies at the present time. (Jour. A. M. A., January 26, 1929, p. 316).

Iodide and Health.—The extensive use of iodine in the prophylaxis of goiter has focused attention on the possible physiologic consequences of prolonged administration of this element. Hanzlik and his co-workers have made observations on rats. To an otherwise adequate ration, sodium iodide was added in amounts that corresponded to 3.3 mg. daily per kilogram throughout the major part of the life of the rats. This dosage would correspond to about 0 23 Gm. daily for an adult of 70 Kg. It was found that the continued administration of iodide in small daily doses in foods over long periods caused moderate though variable increases in weight and growth of the body in the majority of animals. The same tendency was indicated in rats on a deficiency diet. In contrast to the results obtained with iodide were those with sulphocyanate, bromide, arsenic, thallium and manganese. From these experiments there is no reason to believe that the prolonged use of iodide in small doses under ordinary conditions is detrimental. Hanzlik warns, however, that this would not apply to the continued use of iodide in specific conditions of the thyroid, or to large doses of the drug. (Jour. A. M. A., December 1, 1928, p. 1720).

Nitrites in Seasickness.—Sodium nitrite and glycerol trinitrate (nitroglycerin, which has the physiologic action of nitrites) have been used in seasickness but they have not been proved to be specific. From 3 to 5 grains (0.2 to 0.3 Gm.) of sodium nitrite are given at two-hourly intervals for several doses and may be used as a preventive or a curative. (Jour. A. M. A., December 1, 1928, p. 1738).

Health Appeal.—The advertising writers of our progressive land have found the word "IT" in their profession means "Health Appeal." A cursory inspection of current periodicals indicates no lessening of the attention to the health angle. The folly of the all-or-nothing policy in foods, the ridiculousness of some of the arguments as to vitamin content, the preposterous claims for glorified antiseptics, the cautious venturings of time-tried tonics into the public field, and the dazzling claims of the promotors of light arouse the risibilities of the physician by their startling inconsistencies if not by their exaggerations. Who would have thought ten years ago that cigarettes would be sold to the American public by insistence on the healthful qualities of certain brands? The manufacturers of Lucky Strike cigarettes are promulgating a campaign in which they assert that these cigarettes do not cut the wind or impair the physical condition, and that "Lucky Strike satisfies the longing for things that make you fat without interfering with a normal appetite for healthful foods." The human appetite is a delicate mechanism and the attempt to urge that it be aborted or destroyed by the regular use of tobacco is essentially vicious. (Jour. A. M. A., December 8, 1928, p. 1806).

The Potentor Fraud.—In the latter part of 1925, physicians were receiving from one Julius Saur, who called himself an "importer" and did business from 17 West Forty-Second Street, New York City, a form-letter and a circular dealing with a device known as the "Potentor." The Potentor was a small hollow rubber ring with an air valve attached to it. It was sold as a device that would produce sexual rejuvenation in the male. The Postmaster-General issued a fraud order on March 20, 1928, closing the mails to Julius Saur. (Jour. A. M. A., December 8, 1928, p. 1823).

Pascarnata-Merrell.—According to the catalogue of the Wm. S. Merrell Co., Pascarnata is prepared from fresh *Passiflora incarnata* (passion flower) and represents the medicinal virtues of the whole plant, but no statement of the amount of passion flower contained in a given quantity of this proprietary is given. Pascarnata has not been accepted for New and Non-official Remedies nor is any passion flower preparation included in the book. The following are some of the claims advanced for Pascarnata: "It serves as an ideal sporific [soporific?], without narcotic action, and is one of the most desirable antispasmodic and antineuralgics available." "In nervous or sick headache, sleeplessness of typhoid and other fevers, cerebral excitement, overworked mental faculties, brain-fag and the over-stimulation due to worry and hysteria, Pascarnata will be found highly effective." "It is useful as a palliative in spasmodic bronchial asthma and whooping cough, and also in the hysteria due to dysmenorrhea." The following is the estimate of passion flower that is contained in the Epitome of the U. S. Pharmacopeia and National Formulary issued by the Council on Pharmacy and Chemistry: "Exploited by manufacturers of proprietary medicines for the treatment of insomnia, but probably inert." At one time passion flower was a constituent of many so-called female remedies and uterine tonics, but the drug was found to be without effect on the excised guinea-pig uterus. (Jour. A. M. A., December 15, 1928, p. 1914).

Virginia Medical Monthly

FOUNDED BY LANDON B. EDWARDS, M. D., APRIL, 1874.
OWNED BY THE MEDICAL SOCIETY OF VIRGINIA.
PUBLISHED BY THE PUBLISHING COMMITTEE.

A. G. BROWN, JR., M. D., Chairman and Editor, Richmond, Va.

A. L. GRAY, M. D., Richmond, Va.
J. H. NEFF, M. D., University, Va.

AGNES V. EDWARDS, Business Manager and Secretary-Treasurer.

All correspondence regarding editorial matters, articles, advertisements, subscription rates, etc., should be addressed to the Journal, 104½ West Grace Street, Richmond, Va.

All advertisements are received subject to the approval of the Council on Pharmacy and Chemistry of the American Medical Association.

Subscription Price: $2.00 per annum in advance.
Single Copies 20c.

VOL. 56 JUNE, 1929 No. 3

Editorial

Thrombosis of the Coronary Arteries.

Insufficient circulation of blood through the muscle of the "beating" heart brings to the internist a clinical condition of omnious significance. Probably, those clinical entities, angina pectoris and coronary thrombosis, are both fundamentally related to that state of coronary insufficiency in which systolic action, as well as physiologic function of the neuromuscular bundle, is interfered by an ischemia, if not infarction itself. Obliteration of a coronary branch, or occlusion of the blood-flow through the coronary systems, set up the symptoms of pain and produce the imminence of sudden cardiac death.

One may well then, briefly, at least, consider recent inquiry into and publications of work on the coronary circulation. From the fetus at six months or an infant, the two ventricles are approximate equally vascular and, it is only at ages of two to four years that evidence points to fact that the left ventricle is more vascular then the right ventricle. The left ventricle increases in vascularity and by the tenth and fourteenth year the left ventricle is markedly more vascular than the right. The ratio of this predominance of vascular supply in left over the right ventricle continues through life with individual exceptions.

Anatomic review of the blood supply of the heart brings out the fact that left coronary artery supplies the entire anterior surface of the left ventricle and the adjacent third of the anterior surface of the right ventricle, the apex of both ventricles, all the interventricular septum at the apex, the anterior two-thirds of the remainder of the septum and the left half of the posterior surface of the left ventricle.

The right coronary, it is recalled, supplies two-thirds of the anterior surface and all the posterior surface of the right ventricle with the exception of the apex. The right, also, supplies the posterior third of the interventricular septum (except apex) and adjacent half of the basal three-fifths of the posterior surface of the left ventricle. This territorial distribution of the left and right coronary has variations. There is an importance to the definite difference in the branching of the coronary system supplying the walls of the right or left ventricle. As the small branches of the right coronary artery, supplying the right ventricle spread out over the heart in the same general plan as the subdivisions from which they arise, there is not, therefore, that tendency to right coronary occlusion, as is found in the arrangement of the left coronary artery throughout the walls of the left ventricle. Whitten has recently noted that in forty-seven hearts in which definite infarction was found, the right ventricle showed infarction only in four; and, it is possible, he notes, that in these four infarctions may have been due to occlusion of posterior descending artery which is the left ventricular type of artery. The infarction in the field of the left coronary system in the left ventricle rests upon the anatomic arrangement of these arteries which predispose to occlusion. We know the wall of the left ventricle is much thicker in the normal adult heart than that of the right. While the main branches of the left coronary artery course along the surface of the heart just beneath the epicardium the branching system, therefore, instead of spreading out in the same general plane, leave at right angle from the inferior surface of the large vessel or penetrate directly through the myocardium, giving off few branches until they reach the myocardium, where they turn, says Whitten, at a sharp angle and end in a mass of fine arteriols. The perpendicular branches leaving at right angles and penetrating the myocardium appear to immobilize the main branches. This immobilization appears to augment tortuosity of the system and it is at this point, at the ostia of perpendicular vessels penetrating the myocardium, that the greatest amount of arteriosclerotic change occurs in the intima of the vessel wall. This explains upon anatomical grounds the infarction of the left coronary field; in Whitten's cases thirty-six hearts, of the forty-seven studied, showed left ventricle infarction.

XUM

Coronary thrombosis and infarction most commonly occur in the left coronary and left ventricle, rarely in the right. The right ventricle infarction was found by Whitten usually associated with infarction of the left. The infarction of the posterior wall of the left ventricle is more common than has been recognized, says Whitten.

Clinical Signs of Coronary Thrombosis.

One has only to recall, then, the anatomical plan of coronary circulation throughout the "beating" heart to find some explanation for the course of clinical events in and following an angina or coronary thrombosis. Cardiac pain stands out as the master symptoms, though not always, by any means, of extreme severity. There may be a variety of types and locations of distributions of cardiac pain. We may follow Anderson's recent bill of symptoms in coronary thrombosis:

1. An anxious expression.
2. An ashen color of the skin.
3. While the posture is not characteristic, often the patient sits up and leans forward, sometimes holding the chest, transfixed.
4. The pulse is weak: may be alternative, in regularity and irregularity: slow or fast: in this unlike angina, where it is often unaltered.
5. The blood pressure shows a sudden drop in both systolic and diastolic pressure. Often this fall of pressure is from previous high pressure levels.
6. Fever appears; 99° to 101°, appearing at the end of the first day.
7. While respiration may be normal, it may be shallow, rapid, or forced. On auscultation, rales may be heard at the base suggesting possible pneumonia.
8. The heart impulse is feeble: the heart may be increased in its diameter.
9. Heart sounds are usually feeble; a systolic murmur may be heard at the base and apex, and irregularity may be noted in a previously regular heart. Most notable, a pericardial friction sound is heard; the location depends upon the degree and location of the infarction in the myocardium.
10. Pain over the liver makes abdominal pain a confusing sign. Coronary thrombosis may give a liver pain due to distension and irritation of Glisson's capsule, which may resemble pain of "gall-stone colic," acute cholecystitis, acute pancreatitis or appendicitis. A few patients suffering with coronary disease have been subjected to an abdominal operation looking for lesion that did not exist there.
11. Signs of gradual heart failure. The order in which these occur, may be an index as to which ventricle has suffered the infarction: the left predominating.
12. Embolic phenomena occur: the breaking up in the endocardial zone of the infarction may give embolic lesions in arms, legs, head, and lungs.
13. Electrocardiographic signs.

Barnes has recently noted, that cardiac lesions throwing a predominant strain on the left ventricle were associated with inversion of the T-wave in lead I, or in I and II combined, if any T-wave change occurred.

While Parkinson and Bedford, in 1928, published the conclusion that "all available evidence points to the fact that it is an occlusion of the left coronary artery or its branches which produces T-wave of infarction," Barne's study indicates that occlusion of the right coronary artery, when it produces infarction in the posterior portion of the ventricle, also produces characteristic changes in the T-wave.

Disturbances and Disease of Vessels of the Hands and Feet.

Medical practitioners, treating various constitutional diseases, are frequently affronted by more or less obscure or ill-defined disease in the blood vessels of the extremities; localizing there, disease is not symptomatically apparent but never the less the patient may be upon the borderline of serious symptoms. So common is this condition observed in diabetes, arteriosclerosis, and Bright's disease that an understanding of the organic or obliterative type as well as the functional or vasomotor type of the vessels of the extremities may be called to mind. It is with this thought in mind that we present comment upon thrombo-angiitis obliterans.

Recently Allen and Brown* have discussed this subject in a well considered paper and much that we say may be accredited to this work. Peripheral blood vessel diseases may be divided into two general classes: The organic and the functional.

These authors present a table that deserves careful reading for in it may be found a good arrangement of arterial disease in peripheral blood vessels.

This scheme epitomizes the subject and at

*September, 1927—A. J. M. Sc.—Page 319.

a glance enables one to get a general survey of this important and often neglected group of disorders in the circulation of the feet and hands.

The frequency of diagnosis of Raynaud's disease when organic disease is present sometimes advancing with progressing obliteration of the vessels of the extremities makes for the necessity to keep clearly in mind the distinctive signs of each condition.

A consideration of functional or vasomotor disturbances becomes necessary in any discussion of this sort. These abdominal vascular disturbances may be of either (a) vaso constriction or (b) vasodilating, but in both of these, peripheral vessels exhibit normal pulse and color changes. The French physician Raynaud first described the sort of disturbance of hands and feet produced by symmetrical vasoconstriction of the blood vessels bringing about clear cut color changes; such designations as "dead finger," "white finger," "acrocyanosis," and "acroasaphyxia". The vasodilation phenomena of peripheral circulation are characterized by intermittent occurrences of "redness and sense of heat:" designated erythromelalgia. The redness or rubor of obliterating vascular disease is distinguishable from that of erythromelalgia by the absence of heat, by absence or diminution pulsations in arteries, and, by the blanching with elevation of the part.

Organic disease of peripheral vessels in the feet, particularly, are divided by these authors into (1) thrombo-angiitis or Beurger's disease, and (2) arteriosclerotic disease. There are certain symptoms every clinician associates in the extremities with an insufficient blood supply, particularly exhibited during exercise, and these symptoms are a peculiar sense of muscle fatigue, or pain. This pain is often intermittent and takes on the form of intermittent claudication. More striking is the absence of "pulse" in the palpable arteries of the foot, associated with redness of the toes while the foot is hanging down, but with a prompt "blanching" or pallor when the foot is elevated.

In thrombo-angiitis obliterans t r o p h i c

- Functional or Vasomotor types
  - Local distribution
    - Vaso constricting types
      1. Multiple-phase color reaction. (Raynaud's disease.)
      2. One phase color reaction agrocyanosis, dead finger local syncope.
    - Vaso dilating types
      - Erythromelalgia.
  - General distribution
    - Vaso constricting types
      - Primary or essential hypertension, early stages.
    - Vaso dilating types
      - Primary or essential hypertension.
- Local distribution
  1. Arteriosclerosis, with or without thrombosis; diabetic gangrene.
  2. Thrombo-angiitis obliterans (Beurger.)
  3. Simple thrombosis or embolism.
  4. Aneurysm with or without thrombosis.
- General distribution
  - Arteriosclerosis
    - (1) Primary.
    - (2) Secondary to hypertension.

changes occur; following, gangrene may occur involving one toe or the ball of the foot or the entire foot. Pain of persistent and excruciating type may characterize the above progression of pathology.

Disorders and Diseases of Cerebral Arteries.

The circulatory system of the brain is subject to disturbances and diseases that makes comment upon anatomical distribution of blood vessels of interest in this connection. One recalls that the arterial blood supply of the brain is derived from the two vertebral and the two internal carotid arteries, that these four arteries unite in a system of arterial plexuses at the base of the brain, known as the circle of Willis, and send out therefrom branches to the whole of both cerebral hemispheres. The pons, medulla and cerebellum receive blood supply through vertebrals and basilar artery and they participate in the supply of arterial blood through posterior cerebral arteries, to the hemispheres where is also received contributory vascular supply from carotid system.

From the Circle of Willis two groups of arteries go (1) to the interior structures of the brain affording arterial blood supply to such central structures as the basal ganglia and the internal capsule (2) to the surface of the hemispheres affording small branch arterials for blood supply into the cortex—some branching in the gray matter, others penetrating and reaching, in countless offshoots, the basal ganglia. While no anastomosis seems to exist between these groups there is undoubted overlapping of distribution in this field. From the Circle of Willis arises the important brain arteries, anterior, middle and posterior cerebrals and upon them the brain cortex depends for blood supply and in this structure there is a much over-supply of vessels, but only slightest anastomising of vessels of different origins.

The physiologic consideration may be noted in this connection: that the same influences control the circulation of the brain that control the circulation in other parts of the body. For instance, the brain dilates with each cardiac contraction and is influenced by the respiration. While there is dispute of the exact mechanism of the vasomotor control of the cerebral circulation, the action of expiration influences intracranial blood supply and pressure. McLeod sums up the question by saying that "intracranial pressure varies directly with venous pressure within the skull and that it passively follows changes in the pressure in the arteries and veins of the systemic circulation."

From this relationship one can see the influence of the alterations of blood pressure in that great arterial abdominal field: the splanchnics. While it is believed that cerebral arteries have to some extent a vaso mechanism of their own, the above general consideration should be recalled in connection with diseases of brain vessels and clinical exhibitions of these lesions in the every day work among patients with vascular disease.

Thrombosis, Embolism and Cerebral Hemorrhage.

Thrombosis in a cerebral artery occurs as result of embolus or disease of arterial wall.

Embolism of the cerebral artery may occur from a mass of fibrin, a piece of diseased cardiac valve, exfoliation of fragments of internal coat of aorta, a slough from infarcted area of endocardium following coronary thrombosis. The favorite site for the lodgement of cerebral embolus is branches of the middle of the cerebral artery on the left side of the brain—this accident may produce instant death, paralysis, brain abscess or cerebral softening.

Thrombosis from arterial disease may be acute, subacute or chronic. Acute lesions arise from infective processes or specific fevers. Subacute arteritis of brain vessels may arise from syphilis and here the middle cerebral and its branches appear to be favorite site from which the symptomatic evidence arises in this condition. But chronic arteritis or atheroma is the most insidious and usually cause of thrombosis.

Hemorrhage of cerebral vessels dependent upon disease of vessels and arterial hypertension is another accident often found in this group of vascular lesions. The inside vessels are usually affected. The artery of cerebral hemorrhage, of Charcot, brings into the clinical field a large number of patients that require careful medical attention.

Clinically physicians need to be on the alert for incipient stages of vascular disease. Often the most lamentable phase of some chronic malady eventuates in some vascular accident, such as may be illustrated from the symptomatology of the gangrene of the extremities, the anginal, and other heart conditions and the lesions of the brain, as follow upon the ter-

minal eventualities of vascular lesions in these several important regions of the body.

A. G. B.

The Cleveland Clinic Disaster.

The world at large and especially the medical profession has rarely received a greater shock than the distressing calamity which recently befell the Cleveland Clinic, in which the lives of one hundred and twenty-five persons were lost. There has been no precedent in the history of medical institutions that can compare with this tragic event. The sympathy of the entire medical profession has been with Dr. Crile and his colleagues.

The immediate cause seems to have been unquestionably the rapid combustion of nitrocellulose films coated on both sides with silver bromide in dried gelatine emulsion, liberating highly poisonous gases of several different kinds. Chemical experts from the United States Government, municipal and state authorities have been conducting investigations to determine more definitely the details of this accident and the nature of the poisons which rendered such wholesale slaughter.

Considering the fact that millions of feet of film of similar composition are used daily in motion picture exhibitions and almost universally in the roentgen-ray departments of our hospitals and private laboratories throughout the world, is it not a miracle that a similar catastrophe has not previously occurred? There have been a few isolated reports of more or less extensive fires and some instances of poisoning from the gases resulting from film combustion, but the chief dread has been the fire hazard rather than the poisonous gases such as seem to have been the chief agent in the Cleveland catastrophe.

While it behooves all laboratories handling X-ray films to conform to the requirements of the fire prevention organizations, there should be no hysteria, resulting, perhaps, in the expenditure of large sums of money in the construction of expensive storage rooms or other means of filing our films which may by reason of future legislation become a total loss, but let us patiently await the action of the investigating bodies and govern our procedure in accordance with the reports of their findings.

The Virginia Medical Monthly extends to Dr. Crile and his associates of the Cleveland Clinic its profound sympathy in the losses which have been sustained, and begs to assure them of its confidence in the future of the Clinic and its admiration for the splendid work that has already been accomplished.

A. L. G.

News Notes

Finals Medical College of Virginia.

The Medical College of Virginia held its ninety-first commencement exercises for the schools of medicine, dentistry, pharmacy, and nursing in Richmond, from May 25th through May 28, 1929. Student night, held in the John Marshall High School auditorium, was the first event on the program. Dr. George E. Booker delivered the baccalaureate sermon at Centenary Methodist Church on the following day.

Alumni day was held on Monday, May 27th. The members of the alumni association together with the board of visitors of the Medical College and the senior classes were guests at a luncheon in Cabaniss Hall. The ball game of alumni and faculty versus students was played that afternoon. The alumni dinner was held at the Commonwealth Club at 6:30 that evening, followed by the annual reception and dance. Dr. Edwin Alderman, president of the University of Virginia, was the principal speaker at the final exercises held at the Mosque, May 28th.

At these exercises, degrees were conferred upon ninety in the department of medicine, twenty-three in dentistry, twenty-five in pharmacy, nineteen in nursing, five in dental assistants' course, and six in medical technicians' course. It was announced that seventeen of the graduates in medicine would receive commissions as first lieutenants in the Officer's Reserve Corps of the United States Army.

Following are the hospital appointments which were announced at this time:

Johnston-Willis Hospital, Richmond, Va.—Dr. T. E. Knight, Whaleyville.

Medical College of Virginia Hospitals, Richmond, Va.—Drs. P. H. Winston, Virgilina; Margaret Buckner, Clio, S. C.; F. E. La-Prade, Republican Groce; C. A. Nunnally, Richmond; W. A. Seawell, Lemon Springs, N. C.; Hubert A. Shaffer, Parsons, W. Va.; F. I. Steele, Mill Creek, W. Va.; R. C. Thomason, Richmond; B. W. Wilkinson, Shinnston, W. Va.; W. A. Graham, Hills-

XUM

boro, Ky.; O. K. Burnette, Leesville; E. L. Copley, Richmond; N. P. Fitts, Durham, N. C.; W. L. Robinson, Ivy, N. C.; A. B. Choate, Huntersville, N. C.; and T. N. Hunnicutt, Jr., Newport News.

St. Luke's Hospital, Richmond, Va.—Drs. A. N. Chaffin, Wytheville; R. N. DeHart, Floyd; and T. M. Sloan, Charlotte, N. C.

Stuart Circle Hospital, Richmond, Va.—Drs. C. L. Harshbarger, Weyer's Cave; W. E. Tomlinson, Richmond; and Charles R. Robins, Jr., Richmond.

Tucker Sanitorium, Richmond, Va.—Dr. O. L. Hite, Virgilina.

Johnston Memorial Hospital, Abingdon, Va.—Dr. George D. Pettit, Clifton, S. C.

Bluefield Sanitorium, Bluefield, W. Va.—Dr. H. H. Ballard, Peterstown, W. Va.

Long Island Hospital, Boston, Mass.—Drs. J. H. Robinson, Shinnston, W. Va.; and A. C. Chandler, Falls Mill.

Kings County Hospital, Brooklyn, N. Y.—Dr. Ramon D. Garcin, Jr., Richmond.

St. John's Hospital, Brooklyn, N. Y.—Dr. Joseph M. Jabbour, Roanoke.

Charleston General Hospital, Charleston, W. Va.—Drs. W. L. Cooke, Richmond; T. R. Rolston, Staunton; and L. I. Hoke, Princeton, W. Va.

St. John's Hospital, Cleveland, O.—Dr. James R. Brown, Richmond.

Chesapeake and Ohio Railroad Hospital, Clifton Forge, Va.—Dr. E. S. Frazier, Greenville, Ky.

Raiford Hospital, Franklin, Va.—Dr. James E. Nance, Linwood, N. C.

Harrisonburg Hospital, Harrisonburg, Va.—Dr. S. D. Sutliff, Jr., Shippensburg, Pa.

Hazelton Hospital, Hazelton, Pa.—Dr. B. F. Cozart, Stem, N. C.

St. Luke's Hospital, Jacksonville, Fla.—Dr. Wm. P. Stull, Jacksonville, Fla.

City Health Department, Johnson City, Tenn.—Dr. W. G. Preas, Johnson City, Tenn.

Conenaugh Valley Memorial Hospital, Johnstown, Pa.—Dr. David Shevitz, Richmond.

St. Joseph's Hospital, Lancaster, Pa.—Drs. C. H. Bondurant, Roanoke; and B. F. Pearce, Princeton, N. C.

Mount Vernon Hospital, Mt. Vernon, N. Y.—Dr. T. G. Gaskins, Bridgeton, N. C.

Hospital of St. Barnabas, Newark, N. J.—Dr. A. W. Pennington, Newark, N. J.

New York Post-Graduate Hospital and Medical School, New York, N. Y.—Dr. H. R. Hartwell, Roanoke.

Norfolk Protestant Hospital, Norfolk, Va.—Dr. B. L. Parrish, Richmond.

St. Vincent's Hospital, Norfolk, Va.—Drs. William J. Ellis, Covington; S. O. Bennett, Gretna; R. M. Reynolds, Norfolk; and C. P. Ryland, Jr., Clarendon.

Petersburg Hosptal, Petersburg, Va.—Dr. L. W. Holladay, Richmond.

Jewish Hospital, Philadelphia, Pa.—Dr. Joseph Horwitz, Richmond.

Memorial Hospital, Princeton, W. Va.—Dr. C. F. Johnston, Princeton, W. Va.

St. Joseph's Hospital, Reading, Pa.—Drs. L. M. Halloran, Hinton, W. Va.; and D. W. Ritter, Winchester.

Lewis-Gale Hospital, Roanoke, Va.—Drs. E. M. McDaniel, Fayetteville, N. C.; and A. C. Davis, Roanoke.

Memorial Hospital, Roxborough, Pa.—Dr. Morris Marks, Warren, R. I.

Southern Pacific Hospital, San Francisco, Calif.—Dr. W. G. Bishop, Galax.

Saint Anthony's Hospital, St. Louis, Mo.—Dr. Edward G. Dewein, Jr. Belleville, Ill.

Tampa Municipal Hospital, Tampa, Fla.—Dr. J. I. Turbeville, Century.

Holy Name Hospital, Teaneck, N. J.—Dr. James P. Pregnall, Richmond.

Lucas County Hospital, Toledo, O.—Dr. W. M. B. Brown, Greenville, N. C.

Garfield Memorial Hospital, Washington, D. C.—Dr. Shepherd F. Parker, Goldsboro, N. C.

Saint Elizabeth's Hospital, Washington, D. C.—Drs. J. T. Barnes, Kenly, N. C.; A. Ray Dawson, Reedville; C. C. Graves, Jr., Richmond; and A. M. Duval, Rhoadesville.

Walter Reed Hospital, Washington, D. C.—Drs. C. L. Baird, Dillwyn; and S. L. Cooke, Callands.

Ohio Valley General Hospital, Wheeling, W. Va.—Drs. D. D. Wilkinson, Shinnston, W. Va.; and R. B. Grimm, Deep Valley, Pa.

Eastern State Hospital, Williamsburg, Va.—Dr. E. T. Terrell, Jr., Beaver Dam.

City Memorial Hospital, Winston-Salem, N. C.—Drs. W. A. Anthony, Gastonia, N. C.; and B. H. Hopkins, Stuart.

Marine Hospital, U. S. Public Health Service.—Dr. Chapman Binford, Pamplin.

Other members of the graduating class in medicine are:

Dr. George A. Andrews, Mt. Gilead, N. C.
Dr. Rex Blankenship, Richmond.
Dr. Charles Y. Griffith, Hague.
Dr. William F. Hatcher, Clifton Forge.
Dr. Charles Lipshutz, Bayonne, N. J.
Dr. Andrew J. Merva, Nanticoke, Pa.
Dr. Joseph M. Moore, Petersburg.
Dr. Norman G. Patterson, Staunton.
Dr. James S. Richardson, O'Keefe, W. Va.
Dr. Robert R. Sisson, Richmond.
Dr. Robert L. Waddell, Scottsville, N. C.
Dr. Bailey G. Weathers, Shelby, N. C.
Dr. Ellis G. Winstead, Richmond.

The Northern Neck Medical Society,

Composed of doctors residing in the Counties of Northumberland, Richmond, Westmoreland and Lancaster, held its regular meeting at Heathsville, Va., May 22, 1929. The meeting was called to order by the President, Dr. B. H. B. Hubbard, and after routine business was transacted a number of papers were read. Among the essayists were Dr. T. Neill Barnett, of Richmond, Va., who read a paper on "The Importance of Early Diagnosis and Treatment of Peptic Ulcer," which was the subject of much discussion. Dr. Powell Williams gave a talk on "Pernicious Anemia," illustrated by lantern slides showing the marked improvement in the new method of treatment with Liver Extract. Dr .W. Lowndes Peple read a paper on "Congenital Pyloric Stenosis" which was also illustrated with lantern slides. This paper was discussed by Dr. Hubbard, Dr. Downing and several others.

In addition to the large attendance of regular members, the guests consisted of Drs. Wm. R. Weisiger, T. Neill Barnett, Wallace Gill, W. Lowndes Peple, Powell Williams, and Waring Lewis, of Richmond; Drs. Wm. F. Cooper and Samuel Downing, of Newport News; and Drs. J. E. Cole and J. M. Holloway, of Fredericksburg. Among the local attendants were Drs. Hubbard, President, M. C. Oldham, Secretary, B. A. Middleton, Treasurer, C. T. Pierce, R. L. Hubnall, L. E. Cochrell, H. J. Edmunds, S. E. Weymouth, R. E. Booker, and W. B. Richardson. Dr. Brand, of Callao, Va., was elected to membership.

A very delightful luncheon, served in the hotel, was enjoyed by everyone. Heathsville is a very charming old-fashioned town situated on the direct road from Warsaw to Reedville. It is the county seat of Northumberland County, and the meeting was held in the Court House which is a splendid modern structure filled with interesting portraits and pictures of famous men from the County.

At the season of the year, with the laurel in full bloom, the drive from Warsaw to Heathsville is well worth the trip, even if there were no medical meeting going on.

Our Charlottesville Meeting.

Plans are being formulated for the entertainment of the doctors and their guests at the sixtieth annual meeting of the Medical Society of Virginia, to be held in Charlottesville, October 22nd, 23rd and 24th, under the presidency of Dr. J. Bolling Jones, of Petersburg.

Hotels are giving the following rates:

MONTICELLO HOTEL

Single room without bath	$2.00 to $2.50
Single room with bath	$2.50 to $3.00
Double room with bath	$5.00, $6.00 and $6.50
Twin bedroom with bath	$6.00 and $8.00
Annex rooms, single	$1.50 to $2.50
Annex rooms, double	$2.50 to $3.50

GLEASON HOTEL (ALL DOUBLE ROOMS)

1 in room with bath	$2.50
1 in room with running water	2.00
1 in room with running water	1.50

Add $1.00 to above rates for 2 in room.

QUEEN CHARLOTTE HOTEL

1 in room with bath	$2.00 to $3.00
1 in room with running water	1.50 to 2.00

Add $1.00 to above rates for 2 in room.

Free Garage Facilities.

Dr. C. D. Bennett,

Has returned to Blue Ridge Sanitorium, after visiting his family at Chatham. Dr. Bennett is acting as medical adviser at the Sanitorium.

The Amelia County Medical Society,

At a regular meeting on April 19th, elected the following officers for the ensuing year: President, Dr. J. M. Habel, Jetersville; vice-president, Dr. James L. Hamner, Mannboro; secretary-treasurer, Dr. G. A. Arhart, Amelia.

Portrait Presented to Hospital.

In connection with the graduating exercises at the Johnston-Willis Hospital, the nurses alumnae association presented the hospital with a portrait of Dr. A. Murat Willis. Only a few friends, the nurses and the staff were present.

The West Virginia State Medical Association

Held its sixty-second annual meeting at Martinsburg, W. Va., May 21-23. At the meeting of the House of Delegates on the last morn-

XUM

ing, Dr. Walter E. Vest, Huntington, was elected as president for 1930. Other officers selected were Drs. A. B. Eagle, first vice-president; R. V. Shanklin, second vice-president; F. T. Scanlon, third vice-president; T. M. Barber, treasurer; C. G. Morgan, C. H. Hall, S. S. Hall, O. B. Biern, H. G. Steele, and H. A. Walkup, councillors. White Sulphur Springs was selected as the place for the 1930 meeting.

Dr. Guy Hinsdale,

For the last twenty-five years a practitioner at Virginia Hot Springs, has been appointed medical director of the Greenbrier, White Sulphur Springs, W. Va., taking effect June 1st.

The American Gynecological Society,

At its annual meeting held recently, elected Dr. Charles F. Norris, of Philadelphia, Pa., president, and re-elected Dr. Floyd E. Keene, of Philadelphia, secretary.

Raven Society of University of Virginia.

The honorary society established at the university in memory of Edgar Allen Poe, recently elected thirty-seven students, three faculty members, seven alumni, and one member of the board of visitors to its membership.

The three faculty members chosen are: Dr. William Wirt Waddell, Dr. Fletcher Drummond Woodward and Mr. Thomas Cary Johnson.

Engagement Announced.

The Rev. and Mrs. James Herbert Moss announce the engagement of their daughter, Alice Creasy, to Dr. T. Elmore Jones, of Portsmouth. The wedding will take place in June.

Dr. Staunton K. Livingston,

Recently connected with the University of Pennsylvania Hospital, Philadelphia, Pa., is now located in Washington, D. C., where he is limiting his practice to surgery.

The New York Academy of Medicine

Has arranged for a second Fortnight, to be held October 7th to 19th of this year and has chosen as the subject "Functional and Nervous Problems in Medicine and Surgery." Sessions will be held in Teaching Hospitals, using nine of the largest hospitals of the city with a promise of an abundance of clinical material.

The list of speakers includes some of the best known specialists in America and Europe.

The profession generally is invited to attend, no fees being charged.

Plans for a New Hospital,

In Richmond, are under way. Rt. Rev. Andrew J. Brennan, D. D., bishop of the Catholic diocese of Richmond, has purchased a site for a Catholic hospital on the Cary Street Road. It is planned to erect a hospital to accommodate about 150 beds.

Dr. Joseph D. Collins,

Portsmouth, Va., will assume the duties of chief surgeon of the Seaboard Air Line, succeeding the late Dr. Joseph M. Burke.

Dr. Collins graduated from the University College of Medicine in 1905. He is a member of the Medical Society of Virginia.

The Augusta County Medical Association

Held its regular quarterly meeting at the Y. M. C. A., Staunton, Va., Wednesday, May 1st. There were fourteen members present. Interesting papers were read by Drs. Robertson and M. J. Payne. A committee was appointed to consist of the President, Secretary, and Treasurer to arrange for the annual meeting.

"Peter Pan" Is Now a Gold Mine for a Children's Hospital

What child hasn't seen Peter Pan either on the stage or in "the movies?" And now every time any child, young or old, pays for the delight of seeing that whimsical play of Sir James Barrie's, some of the money will go to help little sick children in London to get well again. For that beloved author has given over unconditionally to the Hospital for Sick Children in Great Ormond Street, all his rights to royalties from Peter Pan, a gift which it is estimated will add something like $10,000 a year to the hospital's income. This generous action has already borne fruit, for "the first pirate" has anonymously given a pound note (nearly $5.00) to the hospital, hoping that others might follow his example.

Dr. and Mrs. William A. Shepherd,

And their son, Dan Fitzhugh, of Richmond, Va., have returned from Lexington, where they visited William A. Shepherd, Jr., who is a cadet at the Virginia Military Institute.

Official Call to the Officers, Fellows and Members of the American Medical Association.

The eightieth annual session of the American Medical Association will be held in Portland, Ore., from Monday, July 8th to Friday, July 12, 1929.

The House of Delegates will convene on Monday, July 8th.

The Scientific Assembly of the Association

will open with the General Meeting held on Tuesday, July 9th, at 8:30 P. M.

The various sections of the Scientific Assembly will meet Wednesday, July 10th, at 9:00 A. M. and at 2:00 P. M. and subsequently according to their respective programs. William S. Thayer, President; Frederick C. Warnshuis, Speaker, House of Delegates. Attest: Olin West, Secretary, Chicago, Ill., April 15th.

Dr. R. H. Fuller,

South Boston, Va., is spending a month at the Mayo Clinic, Rochester, Minn.

Sickness Among Working Women of Germany.

Married women form 40 per cent of the gainfully employed women of Germany. The harmful effect on health of the combined demands of employment, housework, and the care of children is considered an important element in the great disparity between the amount of illness among gainfully employed women in that country and among women not so employed. The incidence of illness among the employed women is five to eight times as great as among those not gainfully employed. The sickness-insurance funds, in which membership is compulsory for all employed women and girls, report that the sickness rate for their women members is 23 per cent higher than for the men.

Admiral Cary T. Grayson

Formerly with the U. S. Naval Dispensary, Washington, D. C., has been placed on the retired list of the Navy.

Parke-Davis Scientist Retires.

Following a noteworthy service of thirty-four years with the house of Parke, Davis & Co., Dr. E. M. Houghton retired from active duty on May 1, but will continue as a member of the company's executive staff, with the title of Consulting Director of the Research and Biological Laboratories.

Sale of Grace Hospital in Richmond.

Drs. Robert C. Bryan and H. Stuart McLean announced the sale of Grace Hospital to Drs. A. L. Herring, J. A. Rollings, T. B. Pearman, and E. T. Trice.

Drs. Bryan and MacLean will continue the practice of medicine in Richmond.

Queensland's Maternal Welfare Program.

The Government of Queensland, Australia, has already opened sixty-four maternity hospitals, and eleven more are in process of construction. The hospitals were first provided for the sparsely settled "bush" but are now being built also in more populous centers. A rural nursing program is being developed, and prenatal clinics are being associated with the maternity hospitals in an endeavor to reduce the rate of maternal mortality, which has not appreciably declined in Queensland during the last twenty years. The infant mortality rate of the State, on the other hand, is unusually low. For a recent five-year period it was a little over fifty per 1,000 live births. The lowest rate for any State in the United States birth-registration area during the same period was that of Oregon, which was over four points higher, but the rate for New Zealand was only forty-one.

Dr. Walter E. Vest,

Huntington, W. Va., a member of the Medical Society of Virginia, was recently elected President of the West Virginia State Medical Association.

The Central Tri-State Medical Society of West Virginia, Kentucky, and Ohio

Held its quarterly meeting in Portsmouth, O., May 16th, under the presidency of Dr. William R. Laird, of Montgomery, W. Va., interesting papers were read by Dr. Albert Freiburg, of Cincinnati; Dr. Frank Lahey, of Boston; Dr. David Riesman, of Philadelphia; Dr. J. C. Small, of Philadelphia; and Dr. Lewis G. Cole, of New York City. There were about six hundred physicians present from the three states.

Dr. Roy K. Flannagan,

Assistant state health commissioner and director of rural health work, has returned to his office, after an absence of ten days, during which he made visits of inspection and study at Montgomery, Ala., Nashville, Tenn., and several other places in those states.

Dr. L. S. Early,

Petersburg, Va., recently attended the annual meeting of the National Boy Scout organization in New York City.

Dr. A. F. Wood,

Parksley, Va., and his family are on a two-week trip to the mountains of Virginia, during which he will attend the graduation of his daughter, Virginia, at Randolph-Macon, and his son, Randolph, at the University of Richmond.

Dr. D. Hunter Marrow

Has returned to his home at Union Level,

XUM

Va., after the winter spent at Daytona Beach, Fla., as is his custom.

Dr. Ennion G. Williams,

State Health Commissioner, attended the conference of the State and Provincial Health Officers of North American, in Washington.

Dr. Williams made a report as chairman of the committee on the provision of the Shepherd Towner Act.

Dr. William F. Drewry,

For a number of years of Petersburg, formerly Superintendent of the Central State Hospital, has located in Richmond and entered upon his duties as director of the Bureau of Mental Hygiene in Virginia—a division of the Department of Public Welfare of this State.

Dr. A. L. Carson, Jr.,

Medical College of Virginia, class of 1925, after three years of general practice at Thorpe, W. Va., is now on the obstetrical service of the Nursery and Child's Hospital, New York City.

Tuberculosis Infection Among School Children.

The records of 42,000 school children in Massachusetts examined and tested by the Massachusetts Department of Public Health during a recent three-year period indicate that over one-fourth of them were infected with tuberculosis. No difference in susceptibility was found among children of various nationalities, but approximately twice as many with a history of exposure to pulmonary tuberculosis showed infection as those who had no such history.

Girl Infants More Robust Than Boy Infants.

More boy babies than girl babies are born every year, and more boy babies die, according to the U. S. Children's Bureau. For every 100 deaths among girls under 1 year of age in the United States there have been at least 130 deaths among boys of the same age. It has been suggested that the regional and seasonal differences which have been found in the sex mortality ratios are dependent on the differences in the amount of sunlight reaching the infant, the greater need of the male infant for sunlight being indicated by his greater tendency to certain diseases (such as rickets and tetany) likely to develop when the amount of sunlight is insufficient.

Italy's Physical Education Program.

Physical training of all children up to the age of seventeen, when military training begins for boys, has recently been decreed by the Government of Italy. It is to be directed by a Government organization. All types of physical culture and sport, such as bowling, rowing, and tennis, have been made obligatory. Under the age of fourteen children are not permitted to take part in athletic competitions, but both boys and girls between the age of fourteen and seventeen are permitted to enter them under the supervision of the Italian Olympic Committee. The Fascist Party has made provision for insuring both boys and girls against results from injuries while participating in patriotic, educational, or sporting events authorized by the Government.

Wanted.

A physician for a rural practice in Northern Virginia, fifty miles from Washington, D. C., in a rich, high, beautiful section with good schools, churches, excellent people and some bad roads. Collections 80 to 95 per cent—excellent territory, with good income. Please give the following information in your first letter:

Age; married or single; number of children, with ages; where born?; where educated?; when and where graduated in medicine?; internship, if any, when and where?; religion of self and wife; membership in fraternities, clubs, lodges, etc.; do you hold a license in Virginia

Address, Box 222, Warrenton, Va.

For Sale.

Drugs and splendid office equipment in the best county location in the Shenandoah Valley. $200.00 cash required as evidence of good faith. Address No. 177, care this journal.

Wanted.

Assistant in Eye, Ear, Nose and Throat work. Progressive Virginia city. Prefer a Southern man. If interested apply to No. 176, care Virginia Medical Monthly, Richmond, Va. (Adv.)

Obituary Record

Dr. William Herbert Lewis,

Lawrenceville, Va., died May the 3rd, after having been in bad health for more than a year. Dr. Lewis was in his fifty-seventh year, and was a graduate of the medical department of the University of Virginia, class of 1894. He was a member of the Medical Society of Virginia. His wife survives him.